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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

AN ADDRESS on Darwin's Theory of Man's Descent as it Stands To-day. By Prof. Sir ARTHUR KEITH, M.D., F.R.S. 485

ORIGINAL ARTICLES.

A Case of Malignant Lymphadenosis, with Some Remarks on Leukæmic Diseases in General. By T. VINCENT DICKINSON, M.D., and HENRY LWOW, M.D..... 489

Congenital Hypertrophic Stenosis of the Pylorus. The Results of Rammstedt's Operation. By SEYMOUR BARLING, C.M.G., F.R.C.S. 492

An Outbreak of Illness Caused by *B. dysenteriæ* Flexner. By S. H. WARREN, M.R.C.S., D.P.H. 494

The Schultz-Charlton Reaction. By J. C. BLAKE, M.B., B.S. 495

CLINICAL AND LABORATORY NOTES.

Multiple Diverticula of the Jejunum. By J. ALLAN BERRY, M.S., F.R.C.S... 496

Meningitis Due to a Hæmophilic Bacillus. By JOHN A. BRAXTON HICKS, M.D., D.P.H. ... 497

Femoral Hernia in Children. By ROBERT RUTHERFORD, M.R.C.S. . 498

REVIEWS AND NOTICES OF BOOKS.

A Text-book of Medicine. Edited by Russell L. Cecil, M.D. 505

Diseases of the New-born. By James Burnet, D.M., F.R.C.P. 505

Die Neurosen des Kindesalters. By Dr. W. Cimbal 506

Traité des Maladies de la Prostate. By Georges Luys. Prostatectomies et Tumeurs Malignes. By Victor Pauchet 506

Manual of Surgical Anatomy. By Lewis Beesly, F.R.C.S., and Prof. T. B. Johnston, M.B., Ch.B. 506

Diseases of the Skin and Syphilis. By Prof. Albert Strickler, M.D. 506

Physiology of Reproduction in the Cow. By John Hammond, M.A. 506

Quarterly Journal of Medicine 507

Indian Journal of Medical Research 507

REPORTS AND ANALYTICAL RECORDS.

Ostelin 508

Kia-Ora Products 508

NEW INVENTIONS.

A New Pneumatic Splint Pad. By RUTH E. MILLAR, F.R.C.S., and GEORGE ROBERTSON, F.R.C.S. 508

Indoor Merlin Chairs for One-armed Patients. By Lieut.-Colonel EDWARD GOWLLAND, D.S.O., M.B. 508

LEADING ARTICLES.

THE TREATMENT OF DIABETES 509

TELEGRAPHISTS' CRAMP .. 510

THE DESCENT OF MAN.... 511

ANNOTATIONS.

Surgery and the Diaphragm 511

Erythema Nodosum and Tuberculosis 512

Protection in Radiological Work 512

Cod-Liver Oil and Malt... 512

The N.S.P.C.C. 512

Clinical Perimetry 513

Dante and Rabelais..... 513

Opium-Eating in India.... 513

The Anopheline Mosquito . 514

Types of Streptococci in Scarlet Fever 514

THE SERVICES.

Royal Naval Medical Service.—Royal Army Medical Corps.—Royal Air Force 516

MODERN TECHNIQUE IN TREATMENT.

CCXXXIX.—The Treatment of G.P.I. (Paresis; Dementia Paralytica). I. The Recent Case. By G. W. B. James, *M.C.*, M.D. 515

SPECIAL ARTICLES.

Synthalin in the Treatment of Diabetes. Preliminary Reports to the Medical Research Council 517

British Medical Association: Annual Meeting at Edinburgh: Section of Diseases of Children: Acute Pneumonia in Early Childhood.—Acute Intestinal Obstruction in Infancy and Childhood.—Therapeutic Modifications of the Diet in Infancy 498

The Campaign Against Malaria 522

Ireland: Medical Registration..... 523

United States of America: Vital Statistics.—Industrial Morbidity in Ohio.. 523

OBITUARY.

Alban Henry Griffiths Doran, F.R.C.S.—(*With portrait*)..... 529

William Dixon Jefferson, M.R.C.S..... 530

Arthur Drury, M.B..... 530

Thomas Porter Greenwood, M.R.C.S. 530

Olivier Polhill Turner, M.R.C.S., D.P.H..... 531

Philip Foster, M.D., M.R.C.S..... 531

Francis Barton, M.R.C.S. 531

PUBLIC HEALTH SERVICES.

Reports of Medical Officers of Health: Glasgow.—Aberdeen.—Paisley 524

Infectious Disease in England and Wales 526

CORRESPONDENCE.

Poor-law Hospitals (Dr. Henry J. Bailey)..... 526

The Smoking Habit and Mental Efficiency (Dr. J. Rosslyn Earp)..... 527

Certification of the Insane (Dr. T. Duncan Greenlees) 527

Cancer and Adrenalin (Dr. W. Cramer) 528

The Labelling of Eggs (Dr. E. G. Annis)..... 528

Asthma and Arthritis in Alternation (Dr. Kenneth Stoné) 528

MEDICAL NEWS.

Society of Apothecaries of London 528

Fishermen and Aberdeen Royal Infirmary 492

St. Bartholomew's Hospital 492

Royal Northern Hospitals. 496

Metropolitan Hospital 498

East Ham's Effort 505

Legacy to the Pasteur Institute..... 514

King's College Hospital... 522

Nursery Problems..... 526

The Fabric of St. Thomas's Hospital 526

NOTES, COMMENTS, AND ABSTRACTS.

The Medical Affinities of G. P. R. James..... 532

The Reporting of Inquests 533

Folk-Medicine of Exmoor 533

Pepsin..... 533

The Design of Therapeutic Arc Lamps—(*Illustrated*) 533

The Pathology of Blushing 534

National Institute for the Blind 534

Medical Diary 528

Appointments 531

Vacancies 531

Births, Marriages, Deaths 532

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An Address
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DARWIN'S THEORY OF MAN'S DESCENT AS IT STANDS TO-DAY.

Being the Presidential Address delivered before the British Association for the Advancement of Science, Leeds Meeting, August 31st, 1927,

BY PROF. SIR ARTHUR KEITH, M.D. ABERD., D.Sc., LL.D., F.R.S.

[Sir Arthur Keith prefaced his address with a message to the Prince of Wales in which he stated that the interest His Royal Highness had taken, whilst President last year, in the work of the Association would prove a permanent source of encouragement for all who work for the betterment of life through increase of knowledge. He proceeded:—]

The subject of my address is Man's remote history. Fifty-five years have come and gone since Charles Darwin wrote a history of Man's Descent. How does his work stand the test of time? This is the question I propose to discuss.

THE OPENING SHOT IN THE DARWINIAN BATTLE.

In tracing the course of events which led up to our present conception of man's origin, no place could serve as a historical starting-point so well as Leeds. In this city was fired the first verbal shot of that long and bitter strife which ended in the overthrow of those who defended the Biblical account of man's creation and in a victory for Darwin. On Sept. 24th, 1858—69 years ago—the British Association assembled in this city just as we do to-night; Sir Richard Owen, the first anatomist of his age, stood where I now stand. He had prepared a long address and surveyed, as he was well qualified to do, the whole realm of science; but only those parts which concern man's origin require our attention now. He cited evidence which suggested a much earlier date for the appearance of man on earth than was sanctioned by Biblical records, but poured scorn on the idea that man was merely a transmuted ape. He declared to the assembled Association that the differences between man and ape were so great that it was necessary, in his opinion, to assign mankind to an altogether separate order in the animal kingdom. As this statement fell from the President's lips there was at least one man in the audience whose spirit of opposition was roused—Thomas Henry Huxley—Owen's young and rising antagonist.

OWEN AND HUXLEY.

I have picked out Huxley from the audience because it is necessary for the development of my theme that we should give him our attention for a moment. We know what Huxley's feelings were towards Owen at the date of the Leeds meeting. Six months before he had told his sister that "an internecine feud rages between Owen and myself," and on the eve of his departure for Leeds he wrote to Hooker: "The interesting question arises: Shall I have a row with the great O. there?" I am glad to say the Leeds meeting passed off amicably, but it settled in Huxley's mind what the "row" was to be about when it came. It was to concern man's rightful position in the scale of living things.

MAN'S POSITION IN THE ANIMAL KINGDOM.

Two years later, in 1860, when this Association met in Oxford, Owen gave Huxley the opportunity he desired. In the course of a discussion Owen repeated the statement made at Leeds as to man's separate position, claiming that the human brain had certain structural features never seen in the brain of anthropoid apes. Huxley's reply was a brief and emphatic denial with a promise to produce evidence in due course—which was faithfully kept. This opening passage at arms between our protagonists was followed two days later by that spectacular fight—the most memorable in the history of our Association—in which the Bishop of Oxford, the representative of Owen and of orthodoxy, left his scalp in Huxley's hands. To make his victory decisive and abiding, Huxley published, early in 1863, "The Evidences of Man's Place in Nature," a book which has a very direct bearing on the subject of my discourse. It settled for all time that man's rightful position is among the primates, and that as we anatomists weigh evidence, his nearest living kin are the anthropoid apes.

OWEN'S OPINION OF DARWINISM.

My aim is to make clear to you the foundations on which rest our present-day conception of man's origin. The address delivered by my predecessor from this chair at the Leeds meeting of 1858 has given me the opportunity of placing Huxley's fundamental conception of man's nature in a historical setting. I must now turn to another issue which Sir Richard Owen merely touched upon but which is of supreme interest to us now. He spent the summer in London, just as I have done, writing his address for Leeds and keeping an eye on what was happening at scientific meetings. In his case something really interesting happened. Sir Charles Lyell and Sir Joseph Hooker left with the Linnean Society what appeared to be an ordinary roll of manuscript, but what in reality was a parcel charged with high explosives, prepared by two very innocent-looking men—Alfred Russel Wallace and Charles Darwin. As a matter of honesty it must be admitted that these two men were well aware of the deadly nature of its contents, and knew that if an explosion occurred, man himself, the crown of creation, could not escape its destructive effects. Owen examined the contents of the parcel and came to the conclusion that they were not dangerous; at least, he manifested no sign of alarm in his Presidential Address. He dismissed both Wallace and Darwin, particularly Darwin, in the briefest of paragraphs, at the same time citing passages from his own work to prove that the conception of natural selection as an evolutionary force was one which he had already recognised.

THE TRANSFORMATION OF OUR OUTLOOK ON MAN'S ORIGIN.

I cannot help marvelling over the difference between our outlook to-day and that of the audience which Sir Richard Owen had to face in this city 69 years ago. The vast assemblage which confronted him was convinced, almost without a dissentient, that man had appeared on earth by a special act of creation; whereas the audience which I have now the honour of addressing, and that larger congregation which the wonders of wireless bring within the reach of my voice, if not convinced Darwinists are yet prepared to believe, when full proofs are forthcoming, that man began his career as a humble primate animal, and has reached his present estate by the action and reaction of biological forces which have been and are ever at work within his body and brain.

DARWIN'S GENERALSHIP.

This transformation of outlook on man's origin is one of the marvels of the nineteenth century, and to see how it was effected we must turn our attention for a little while to the village of Down in the Kentish uplands and note what Charles Darwin was doing on the very day that Sir Richard Owen was delivering his address here in Leeds. He sat in his study struggling with the first chapter of a new book; but no one foresaw, Owen least of all, that the publication of the completed book, "The Origin of Species," 15 months later (1859) was to effect a sweeping revolution in our way of looking at living things and to initiate a new period in human thought—the

Darwinian period—in which we still are. Without knowing it, Darwin was a consummate general. He did not launch his first campaign until he had spent 22 years in stocking his arsenal with ample stores of tested and assorted fact. Having won territory with "The Origin of Species," he immediately set to work to consolidate his gains by the publication in 1868 of another book, "The Variation of Animals and Plants under Domestication"—a great and valuable treasury of biological observation. Having thus established an advanced base, he moved forwards on his final objective—the problem of human beginnings—by the publication of "The Descent of Man" (1871), and that citadel capitulated to him. To make victory doubly certain he issued in the following year—1872—"The Expression of the Emotions in Man and Animals." Many a soldier of truth had attempted this citadel before Darwin's day, but they failed because they had neither his generalship nor his artillery.

History as Written by Darwin.

Will Darwin's victory endure for all time? Before attempting to answer this question, let us look at what kind of book "The Descent of Man" is. It is a book of history—the history of man, written in a new way—the way discovered by Charles Darwin. Permit me to illustrate the Darwinian way of writing history. If a history of the modern bicycle had to be written in the orthodox way, then we should search dated records until every stage was found which linked the two-wheeled hobby-horse, bestrode by tall-hatted fashionable men at the beginning of the nineteenth century, to the modern "jeopardy" which now flashes past us in country lanes. But suppose there were no dated records—only a jumble of antiquated machines stored in the cellar of a museum. We should, in this case, have to adopt Darwin's way of writing history. By an exact and systematic comparison of one machine with another we could infer the relationship of one to another and tell the order of their appearance, but as to the date at which each type appeared and the length of time it remained in fashion, we could say very little. It was by adopting this circumstantial method that Darwin succeeded in writing the history of man. He gathered historical documents from the body and behaviour of man and compared them with observations made on the body and behaviour of every animal which showed the least resemblance to man. He studied all that was known in his day of man's embryological history and noted resemblances and differences in the corresponding histories of other animals. He took into consideration the manner in which the living tissues of man react to disease, to drugs, and to environment; he had to account for the existence of diverse races of mankind. By a logical analysis of his facts Darwin reconstructed and wrote a history of man.

Darwin's Impregnable Position: Evidence of Fossil Remains.

Fifty-six years have come and gone since that history was written; an enormous body of new evidence has poured in upon us. We are now able to fill in many pages which Darwin had perforce to leave blank, and we have found it necessary to alter details in his narrative, but the fundamentals of Darwin's outline of man's history remain unshaken. Nay, so strong has his position become that I am convinced that it never can be shaken.

Why do I say so confidently that Darwin's position has become impregnable? It is because of what has happened since his death in 1882. Since then we have succeeded in tracing man by means of his fossil remains and by his stone implements backwards in time to the very beginning of that period of the earth's history to which the name Pleistocene is given. We thus reach a point in history which is distant from us at least 200,000 years, perhaps three times that amount. Nay, we have gone farther, and traced him into the older and longer period which preceded the Pleistocene—the Pliocene. It was in strata laid down by a stream in Java during the latter part of the Pliocene period that Dr. Eugene Dubois found, ten years after Darwin's death, the fossil remains of that remarkable representative of primitive humanity to which he gave the name *Pithecanthropus*, or ape-man; from Pliocene deposits of East Anglia Mr. Reid Moir has recovered rude stone implements. If Darwin was right, than as we trace man backwards in the scale of time he should become more bestial in form—nearer to the ape. That is what we have found. But if we regard *Pithecanthropus* with his small and simple yet human brain as a fair representative of the men of the Pliocene period, then evolution must have proceeded at an unexpectedly rapid rate to culminate to-day in the higher races of mankind.

Man's Descent has not been in a Straight Line.

The evidence of man's evolution from an ape-like being, obtained from a study of fossil remains, is definite and irrefutable, but the process has been infinitely more complex than was suspected in Darwin's time. Our older and discarded conception of man's transformation was depicted in that well-known diagram which showed a single file of skeletons, the gibbon at one end and man at the other. In our original simplicity we expected, as we traced man backwards in time, that we should encounter a graded series of fossil forms—a series which would carry him in a straight line towards an anthropoid ancester. We should never have made this initial mistake if we had remembered that the guide to the world of the past is the world of the present. In our time man is represented not by one but by many and diverse races—black, brown, yellow, and white; some of these are rapidly expanding, others are as rapidly disappearing. Our searches have shown that in remote times the world was peopled, sparsely it is true, with races showing even a greater diversity than those of to-day, and that already the same process of replacement was at work. To unravel man's pedigree we have to thread our way, not along the links of a chain, but through the meshes of a complicated network.

Diversity of Form in Ancient Times.

We made another mistake. Seeing that in our search for man's ancestry we expected to reach an age when the beings we should have to deal with would be simian rather than human, we ought to have marked the conditions which prevail amongst living anthropoid apes. We ought to have been prepared to find, as we approached a distant point in the geological horizon, that the forms encountered would be as widely different as are the gorilla, chimpanzee, and orang, and confined, as these great anthropoids now are, to limited parts of the earth's surface. That is what we are now realising; as we go backwards in time we discover that mankind becomes broken up, not into separate races as in the world of to-day, but into numerous and separate species. When we go into a still more remote past they become so unlike that we have to regard them not as belonging to separate species but different genera. It is amongst this welter of extinct fossil forms which strew the ancient world that we have to trace the zigzag line of man's descent. Do you wonder we sometimes falter and follow false clues?

Discordant Evolution.

We committed a still further blunder when we set out on the search for man's ancestry; indeed, some of us are still making it. We expected that man's evolution would pursue not only an orderly file of stages but that every part of his body—skull, brain, jaws, feet, skin, body, arms, and legs—would at each stage become a little less ape-like, a little more man-like. Our searches have shown us that man's evolution has not proceeded in this orderly manner. In some extinct races, while one part of the body has moved forwards another part has lagged behind. Let me illustrate this point, because it is important.

We now know that, as Darwin sat in his study at Down, there lay hidden at Piltdown, in Sussex, not 30 miles distant from him, sealed up in a bed of gravel, a fossil human skull and jaw. In 1912, 30 years after Darwin's death, Mr. Charles Dawson discovered this skull, and my friend Sir Arthur Smith Woodward described it, and rightly recognised that skull and jaw were parts of the same individual, and that this individual had lived, as was determined by geological and other evidence, in the opening phase of the Pleistocene period. We may confidently presume that this individual was representative of the people who inhabited England at this remote date. The skull, although deeply mineralised and thick-walled, might well have been the rude forerunner of a modern skull, but the lower jaw was so ape-like that some experts denied that it went with the human fossil skull at all, and supposed it to be the lower jaw of some extinct kind of chimpanzee. This mistake would never have been made if those concerned had studied the comparative anatomy of anthropoid apes. Such a study would have prepared them to meet with the discordances of evolution. The same irregularity in the progression of parts is evident in the anatomy of *Pithecanthropus*, the oldest and most primitive form of humanity so far discovered. The thigh-bone might easily be that of modern man, the skull-cap that of an ape, but the brain within that cap, as we now know, had passed well beyond an anthropoid status. If merely a lower jaw had been found at Piltdown an ancient Englishman would have been wrongly labelled "higher anthropoid ape"; if only the thigh-bone of *Pithecanthropus* had come to light in Java, then an ancient Javanese, almost deserving the title of anthropoid, would have passed muster as a man.

Blanks Still Remain in the Geological Record.

Such examples illustrate the difficulties and dangers which beset the task of unravelling man's ancestry. There are other difficulties; there still remain great blanks in the geological record of man's evolution. As our search proceeds these blanks will be filled in, but in the meantime let us note their nature and their extent. By the discovery of fossil remains we have followed man backwards to the close of the Pliocene—a period which endured at least for a quarter of a million years, but we have not yet succeeded in tracing him through this period. It is true that we have found fossil teeth in Pliocene deposits which may be those of an ape-like man or of a man-like ape; until we find other parts of their bodies we cannot decide. When we pass into the still older Miocene period—one which was certainly twice as long as the Pliocene—we are in the heyday of anthropoid history. Thanks to the labours of Dr. Guy E. Pilgrim, of the Indian Geological Survey, we know already of a dozen different kinds of great anthropoids which lived in Himalayan jungles during middle and later Miocene times; we know of at least three other kinds of great anthropoids which lived in the contemporary jungles of Europe. Unfortunately, we have found as yet only the most resistant parts of their bodies—teeth and fragments of jaw. Do some of these fragments represent a human ancestor? We cannot decide until a lucky chance brings to light a limb-bone or a piece of skull, but no one can compare the teeth of these Miocene anthropoids with those of primitive man, as has been done so thoroughly by Prof. William K. Gregory, and escape the conviction that in the dentitions of the extinct anthropoids of the Miocene jungles we have the ancestral forms of human teeth.

Date of Man's Emergence.

It is useless to go to strata still older than the Miocene in search of man's emergence; in such strata we have found only fossil traces of emerging anthropoids. All the evidence now at our disposal supports the conclusion that man has arisen, as Lamarck and Darwin suspected, from an anthropoid ape not higher in the zoological scale than a chimpanzee, and that the date at which human and anthropoid lines of descent began to diverge lies near the beginning of the Miocene period. On our modest scale of reckoning, that gives man the respectable antiquity of about one million years.

Proofs of our Anthropoid Ancestry.

Our geological search, which I have summarised all too briefly, has not produced so far the final and conclusive evidence of man's anthropoid origin; we have not found as yet the human *imago* emerging from its anthropoid encasement. Why, then, do modern anthropologists share the conviction that there has been an anthropoid stage in our ancestry? They are no more blind than you are to the degree of difference which separates man and ape in structure, in appearance, and in behaviour. I must touch on the sources of this conviction only in a passing manner. Early in the present century Prof. G. H. F. Nuttall, of Cambridge University, discovered a trustworthy and exact method of determining the affinity of one species of animal to another by comparing the reactions of their blood. He found that the blood of man and that of the great anthropoid apes gave almost the same reaction. Bacteriologists find that the living anthropoid body possesses almost the same susceptibilities to infections, and manifests the same reactions, as does the body of man. So alike are the brains of man and anthropoid in their structural organisation that surgeons and physiologists transfer experimental observations from the one to the other. When the human embryo establishes itself in the womb it throws out structures of a most complex nature to effect a connexion with the maternal body. We now know that exactly the same elaborate processes occur in the anthropoid womb and in no other. We find the same vestigial structures—the same "evolutionary post-marks"—in the bodies of man and anthropoid. The anthropoid mother fondles, nurses, and suckles her young in the human manner. This is but a tithe of the striking and intimate points in which man resembles the anthropoid ape. In what other way can such a myriad of coincidences be explained except by presuming a common ancestry for both?

Evolution of Man's Brain.

The crucial chapters in Darwin's "Descent of Man" are those in which he seeks to give a historical account of the rise of man's brain and of the varied functions which that organ subserves. How do these chapters stand to-day? Darwin was not a professional anatomist, and therefore accepted Huxley's statement that there was no structure in the human brain that was not already present in that of the anthropoid. In Huxley's opinion the human brain was but a richly annotated edition of the simpler and older anthropoid book, and that this edition, in turn, was but the expanded issue of the still older original primate publication. Since this statement was made thousands of anatomists and physiologists have studied and compared the brain of man and ape; only a few months ago Prof. G. Elliot Smith summarised the result of this intensive inquiry as follows: "No structure found in the brain of an ape is lacking in the human brain, and, on the other hand, the human brain reveals no formation *of any sort* that is not present in the brain of the gorilla or chimpanzee. . . . The only distinctive feature of the human brain is a quantitative one." The difference is only quantitative but its importance cannot be exaggerated. In the anthropoid brain are to be recognised all those parts which have become so enormous in the human brain. It is the expansion of just those parts which has given man his powers of feeling, understanding, acting, speaking, and learning.

Evidence of Psychology.

Darwin himself approached this problem not as an anatomist but as a psychologist, and after many years of painstaking and exact observation succeeded

in convincing himself that, immeasurable as are the differences between the mentality of man and ape, they are of degree, not of kind. Prolonged researches made by modern psychologists have but verified and extended Darwin's conclusions. No matter what line of evidence we elect to follow—evidence gathered by anatomists, by embryologists, by physiologists, or by psychologists—we reach the conviction that man's brain has been evolved from that of an anthropoid ape, and that in the process no new structure has been introduced and no new or strange faculty interpolated.

UNEXPLAINED PROBLEMS.

In these days our knowledge of the elaborate architecture and delicate machinery of the human brain makes rapid progress, but I should mislead if I suggested that finality is in sight. Far from it: our inquiries are but begun. There is so much we do not yet understand. Will the day ever come when we can explain why the brain of man has made such great progress while that of his cousin the gorilla has fallen so far behind? Can we explain why inherited ability falls to one family and not to another, or why, in the matter of cerebral endowment, one race of mankind has fared so much better than another? We have as yet no explanation to offer, but an observation made 20 years ago by one on whom nature has showered great gifts—a former President of this Association and the doyen of British zoologists, Sir E. Ray Lankester—deserves quotation in this connexion: "The leading feature in the development and separation of man from other animals is undoubtedly the relative enormous size of the brain in man and the corresponding increase in its activities and capacity. It is a striking fact that it was not in the ancestors of man alone that this increase in the size of the brain took place at this same period—the Miocene. Other great mammals of the early Tertiary period were in the same case." When primates made their first appearance in geological records they were, one and all, small-brained. We have to recognise that the tendency to increase of brain, which culminated in the production of the human organ, was not confined to man's ancestry but appeared in diverse branches of the mammalian stock at a corresponding period of the earth's history.

DARWIN'S CONCEPTION OF EVOLUTION ILLUSTRATED.

I have spoken of Darwin as a historian. To describe events and to give the order of their occurrence is the easier part of a historian's task; his real difficulties begin when he seeks to interpret the happenings of history, to detect the causes which produced them, and explain why one event follows as a direct sequel to another. Up to this point we have been considering only the materials for man's history, and placing them, so far as our scanty information allows, in the order of their sequence, but now we have to seek out the biological processes and controlling influences which have shaped the evolutionary histories of man and ape. The evolution of new types of man or of ape is one thing, and the evolution of new types of motor-cars is another, yet for the purposes of clear thinking it will repay us to use the one example to illustrate the other. In the evolution of motor vehicles Darwin's law of selection has prevailed; there has been severe competition, and the types which have answered best to the needs and tastes of the public have survived. The public has selected on two grounds—first for utility, thus illustrating Darwin's law of natural selection, and secondly because of appearance's sake; for, as most people know, a new car has to satisfy not only the utilitarian demands of its prospective master but also the æsthetic tastes of its prospective mistress, therein illustrating Darwin's second law—the law of sexual selection. That selection, both utilitarian and æsthetic, is producing an effect on modern races of mankind and in surviving kinds of ape, as Darwin supposed, cannot well be questioned. In recent centuries the inter-racial competition amongst men for the arable lands of the world is keener than in any known period of human history.

PRODUCTION OF NEW TYPES.

The public has selected its favoured types of car, but it has had no direct hand in designing and producing modifications and improvements which have appeared year after year. To understand how such modifications are produced the inquirer must enter a factory and not only watch artisans shaping and fitting parts together but also visit the designer's office. In this way an inquirer will obtain a glimpse of the machinery concerned in the evolution of motor-cars. If we are to understand the machinery which underlies the evolution of man and of ape, we have to enter the "factories" where they are produced—look within the womb and see the ovum being transformed into an embryo, the embryo into a fœtus, and the fœtus into a babe. After birth we may note infancy passing into childhood, childhood into adolescence, adolescence into maturity, and maturity into old age. Merely to register the stages of change is not enough; to understand the controlling machinery we have to search out and uncover the processes which are at work within developing and growing things and the influences which coördinate and control all the processes of development and of growth. When we have discovered the machinery of development and of growth we shall also know the machinery of evolution, for they are the same.

MACHINE AND ANIMAL EVOLUTION CONTRASTED.

If the simile I have used would sound strange in Darwin's ear could he hear it, the underlying meaning would be familiar to him. Over and over again he declared that he did not know how "variations" were produced, favourable or otherwise; nor could he have known, for in his time hormones were undreamt-of and experimental embryology scarcely born. With these recent discoveries new vistas opened up for students of evolution. The moment we begin to work out the simile I have used and compare the evolutionary machinery in a motor factory with that which regulates the development of an embryo within the womb, we realise how different the two processes are. Let us imagine for a moment what changes would be necessary were we to introduce "embryological processes" into a car factory. We have to conceive a workshop teeming with clustering swarms of microscopic artisans, mere specks of living matter. In one end of this factory we find swarms busy with cylinders, and as we pass along we note that every part of a car is in process of manufacture, each part being the business of a particular brigade of microscopic workmen. There is no apprenticeship in this factory, every employee is born, just as a hive-bee is, with his skill already fully developed. No plans or patterns are supplied; every workman has the needed design in his head from birth. There is neither manager, overseer, nor foreman to direct and coördinate the activities of the vast artisan armies. And yet if parts are to fit when assembled, if pinions are to mesh and engines run smoothly, there must be some method of coördination. It has to be a method plastic enough to permit difficulties to be overcome when such are encountered and to permit the introduction of advantageous modifications when these are needed. A modern works manager would be hard put to it were he asked to devise an automatic system of control for such a factory, yet it is just such a system that we are now obtaining glimpses of in the living workshops of nature.

MACHINERY OF DEVELOPMENT.

I have employed a crude simile to give the lay mind an inkling of what happens in that "factory" where the most complicated of machines are forged—the human body and brain. The fertilised ovum divides and redivides; one brood of microscopic living units succeeds another, and as each is produced the units group themselves to form the "parts" of an embryo. Each "part" is a living society; the

embryo is a huge congeries of interdependent societies. How are their respective needs regulated, their freedoms protected, and their manœuvres timed? Experimental embryologists have begun to explore and discover the machinery of regulation. We know enough to realise that it will take many generations of investigators to work over the great and new field which is thus opening up. When this is done we shall be in a better position to discuss the cause of "variation" and the machinery of evolution.

MACHINERY OF GROWTH.

If we know only a little concerning the system of government which prevails in the developing embryo we can claim that the system which prevails in the growing body, as it passes from infancy to maturity, is becoming better known to us every year. The influence of the sex glands on the growth of the body has been known since ancient times; their removal in youth leads to a transformation in the growth of every part of the body, altering at the same time the reactions and temperament of the brain. In more recent years medical men have observed that characteristic alterations in the appearance and constitution of the human body can be produced by the action of other glands—the pituitary, thyroid, parathyroid, and adrenals. Under the disorderly action of one or other of these glands individuals may, in the course of a few years, take on so changed an appearance that the differences between them and their fellows become as great as, or even greater than, those which separate one race of mankind from another. The physical characters which are thus altered are just those which mark one race off from another. How such effects are produced we did not know until 1904, when the late Prof. E. H. Starling, a leader amongst the great physiologists of our time, laid bare an ancient and fundamental law in the living animal body—his law of hormones. I have pictured the body of a growing child as an immense society made up of myriads of microscopic living units, ever increasing in numbers. One of the ways—probably the oldest and most important way—in which the activities of the communities of the body are coördinated and regulated is by the postal system discovered by Starling, wherein the missives are hormones—chemical substances in ultra-microscopic amounts, despatched from one community to another in the circulating blood. Clearly the discovery of this ancient and intricate system opens up fresh vistas to the student of man's evolution. How Darwin would have welcomed this discovery! It would have given him a rational explanation to so many of his unsolved puzzles, including that of "correlated variations." Nor can I in this connexion forbear to mention the name of one who presided so ably over the affairs of this Association 15 years ago—Sir E. Sharpey-Schafer. He was the pioneer who opened up this field of investigation, and has done more than anyone to place our knowledge of the nature and action of the glands of internal secretion on a precise basis of experimental observation. With such sources of knowledge being ever extended and others of great importance, such as the study of heredity, which have been left unmentioned, we are justified in the hope that man will be able in due time not only to write his own history but to explain how and why events took the course they did.

Briefly I have attempted to answer a question of momentous importance to all of us—What is man's origin? Was Darwin right when he said that man, under the action of biological forces which can be observed and measured, has been raised from a place amongst anthropoid apes to that which he now occupies? The answer is Yes! and in returning this verdict I speak but as foreman of the jury—a jury which has been empannelled from men who have devoted a lifetime to weighing the evidence. To the best of my ability I have avoided, in laying before you the evidence on which our verdict was found, the rôle of special pleader, being content to follow Darwin's own example—Let the truth speak for itself.

A CASE OF
MALIGNANT LYMPHADENOSIS,
WITH SOME REMARKS ON LEUKÆMIC DISEASES IN GENERAL.

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THE great variety of symptoms met with in diseases of leukæmic type sometimes makes it very difficult to fit a case of this kind into a certain group according to the usual classification. Since Virchow and John Hughes Bennett described leukæmia as distinct from leucocytosis and pyæmia, authors in different countries when publishing their cases have tried to assort their observations into a multitude of new groups. Thus we find in the literature on the subject a legion of diseases which very often indeed are indistinguishable from each other and which not always bear happily chosen terms. The reason of this confusing classification lies not only in the obscure ætiology of the disease, but also in the variable relations between the clinical history, the condition of the blood, and the histological picture of the organs affected. The as yet unsettled origin of blood-cells makes a clear classification still more difficult.

The early authors considered the disease merely as a pathological condition of the blood, and the changes in the organs were looked upon as the result of a secondary spread of pathological cells from the blood. The pathological blood-picture was thus regarded as an essential part of the disease. Hence the term leukæmia or leukocythæmia. When Cohnheim and, later, Pinkus described a condition which corresponded clinically and histologically with the usual type of leukæmia, but without the changes in the blood, they called it pseudoleukæmia, still apparently under the impression that there could be no true leukæmia without a definite pathological blood-picture.

Since then we have learned to regard the histological picture of the organs affected as most characteristic of the disease, and the leukæmic condition of blood only as a frequent though not essential symptom for diagnosis. We know now that leukæmia and some allied diseases represent a systemic affection of the hæmatopoietic tissue, which is scattered all over the organism. The histological organic changes are due to a proliferation *in situ* originating from undifferentiated perivascular and connective tissue cells, upon which groups of cells especially Ferrata's researches in recent years have thrown some light.

As long as the mystery of the primary cause of this abnormal proliferation remains unsolved, the most important guiding points in the classification of these diseases should therefore be the appearance of the histological picture of different organs. If we adopt this point of view, terms like pseudoleukæmia or even leukæmia will appear to be very unscientific. The term pseudoleukæmia, which is still used by many authors, is particularly misleading. Some authors,[1] like Rieux, include in this group even such diseases as Hodgkin's or Gaucher's splenomegaly. Pappenheim,[2] like many other German authors, divides diseases of the hæmatopoietic system into two main groups: (1) generalised leucocytomatosis; (2) generalised granulomatosis. To use Pappenheim's own words:—

> "The histological difference between the leucocytomatous (myeloid and lymphadenoid) and granulomatous forms seems to be that in the first case there is a proliferation of the myeloid and myelopotential, or lymphadenoid and lymphopotential, parenchyma, while in the case of the granulomatosis there is a proliferation of the interparenchymatous stroma, with a tendency to scar tissue formation and sclerosis."

Thus to the category "granulomatosis" would belong Hodgkins' disease and all the generalised inflammatory diseases of lymphatic glands—i.e., of tuberculous or syphilitic nature, Banti's disease, &c.

To the other group belong all the varieties of leukæmias. This group is subdivided by Pappenheim, Rieux, Clerc,[3] and others in a very similar way to each other. The difference lies more with the nomenclature. The most popular classification is into: (1) lymphadenosis, corresponding with lymphatic leukæmia; and (2) myelosis (Schridde), identical with myeloid leukæmia. Each of them may have a leukæmic or an aleukæmic blood-picture. And, according to Rieux, each of them may be of a benign or malignant type, and may be localised or generalised. We may thus meet with a benign generalised leukæmic lymphadenosis, which would correspond with the term lymphatic leukæmia, or in another case we may find a localised malignant aleukæmic lymphadenosis, which would correspond with Kundrat-Paltauf's lymphosarcoma; and in fact all possible combinations may be met with.

The advantage of this terminology is, that (1) it emphasises the histological changes in the tissues; (2) shows the common nature of all these diseases, and (3) shows that there are no clear limits between them—i.e., one type may pass into another during the course of the disease. A case we had recently the opportunity of observing gives, in our opinion, quite a good illustration of the relationship between these groups.

History of the Case.

The patient, A. B., an Italian shopkeeper, aged 40, was admitted to the Italian Hospital on March 13th, 1927. He was a tall, fairly well nourished and strongly built man. He complained of pain in the left side for the last three weeks. He had suffered previously from cough every winter, from frequent indigestion and lassitude. There had been no other previous illnesses. On examination the face and mucous membranes were found to be pale. Temperature, pulse, respiration were normal. Blood pressure 120/90.

The left hypochondrium was rigid and very tender, and a hard tumour could be felt occupying the whole of the left hypochondriac and partly the epigastric region, with a hard edge three fingers below the left costal margin. No notch could be felt, and the tumour did not move on respiration. It was continuous across the abdomen with the edge of the right lobe of the liver, which reached three fingers below the right costal margin.

The patient had noticed the swelling only for three weeks. Lungs: the left base was dull and some friction could be heard. Right upper lobe showed diminished air entry. The sputum contained pneumococci and streptococci; no tubercle bacilli. The heart was pushed over to the right and upwards. An X ray picture showed the left dome of diaphragm greatly pushed upwards.

Lymph glands, cervical, axillary, inguinal, and femoral, very large, discrete, and freely movable. Some of the cervical glands were as large as a pigeon's egg. Tonsils not enlarged. Per rectum some very large glands could be felt at the bifurcation of the aorta. The patient stated that he had had all these enlarged glands for many years, but he was not quite certain if some of them had increased in size lately. His medical attendant told us that the patient had these enlarged glands as far back as ten years ago, when he came to him for some gastric trouble and wanted to have a large cervical gland removed. There was, however, no blood-count made at this time.

Urine contained a trace of albumin, no casts, a few *B. coli*. The blood-count made on March 18th gave normal figures: 8200 white cells and a normal differential count. 20th: The spleen now reached the umbilicus. 21st: A cervical lymphatic gland was excised for a biopsy: it was grey in appearance and of a very soft consistency; microscopically it showed absence of the usual lymph gland structure with its regeneration centres. There was but little stroma and a few vessels were seen. It consisted of a uniform mass of cells having the appearance of small lymphocytes packed tightly within the capsule and compressed near the periphery. Amongst them there were scattered some cells showing mitosis and a few endothelial cells. Wassermann reaction was negative. A couple of days later the throat became dry and inflamed. Some ecchymosis were seen on the palate and back of tongue.

The patient had a severe epistaxis on March 25th. An examination of blood made on the 28th showed red cells 4,810,000, hæmoglobin 90 per cent., white cells 6500; differential count: lymphocytes (the majority being of the small type) 45 per cent., segmented neutrophiles 35 per cent., myelocytes 4 per cent., young metamyelocytes 2 per cent., neutrophiles with a rod-shaped nucleus 10 per cent., basophiles 3 per cent., eosinophiles 1 per cent. On the 29th another differential count was made showing neutrophiles 65 per cent., lymphocytes 33 per cent., hyalines 2 per cent.

The abdomen became now more and more distended. On March 30th the liver reached a line from the right iliac spine to the umbilicus. There was evidence of free fluid in the abdominal cavity. On the 29th the temperature, which till then had not risen above 99·4° in the evening, went up to 100·6°, but came down again to 98° on the 31st.

A differential count on April 2nd gave neutrophiles 25 per cent., large lymphocytes 20 per cent., small lymphocytes 35 per cent., hyalines 4 per cent., eosinophiles 1 per cent., myelocytes 5 per cent., metamyelocytes 5 per cent., lymphoblasts 5 per cent. Platelets 220,000 per c.cm., red cells normal. Œdema of both legs, probably due to pressure, appeared on April 5th. Patient complained of very much abdominal pain.

On April 7th another examination of blood showed: red cells 4,600,000, hæmoglobin 90 per cent., white cells 60,000; differential count: small lymphocytes 70½ per cent., large lymphocytes 15½ per cent., lymphoblasts 1½ per cent., segmented neutrophiles 2½ per cent., neutrophiles with rod-shaped nuclei 4½ per cent., myelocytes 1 per cent., metamyelocytes 4½ per cent.

The general condition of the patient became now rapidly worse. On April 16th he had a severe rectal hæmorrhage. An examination of blood done the same day gave red cells 4,120,000, hæmoglobin 75 per cent., anisocytosis and poikilocytosis. White cells 68,400, small lymphocytes 89½ per cent., large 7 per cent., myelocytes ½ per cent., metamyelocytes 2 per cent., segmented neutrophiles 1 per cent. On the 17th the patient had another rectal hæmorrhage, and he died in the evening of the same day. The temperature went up shortly before death to 100·8°, this being the highest noted temperature during the patient's stay at the hospital.

Necropsy.—In the thorax: there was a chain of large glands in the mediastinum. They were all soft, of a putty-like consistency. There were several infiltrations of a similar character in the wall of the thorax and on the diaphragm. Lungs: nothing abnormal. Heart: dilated and showing myocardial degeneration. Left dome of diaphragm pushed very much upwards by the spleen. Abdomen: free fluid present. Spleen weighed 8½ lb. and was of hard consistency. There were signs of a perisplenitis. The section showed on a dark brown background large, irregular, confluent, grey patches. Several smaller and larger infarcts were present.

The liver weighed 9¼ lb. On section it had greyish irregular patches of different sizes. The posterior wall of the stomach contained a round patch of infiltration which unfortunately was overlooked at the microscopical examination. The kidneys did not show anything abnormal on naked-eye examination. There were enlarged lymph glands forming huge confluent masses between the pancreas and the stomach. Some of them were larger than a man's fist. Glands in other situations were considerably enlarged. The bone marrow of the right humerus, which was sawn open longitudinally, was found to be of dark red colour.

Microscopic Examination.—Lymph glands showed the same structure as that described above in the biopsy. The spleen was packed with a mass of cells uniform in character and of the same appearance as in lymph glands and other organs. They were of the size of a small lymphocyte with a darkly staining nucleus and a narrow rim of cytoplasm. There was only some scanty necrotic spleen pulp present. The liver showed a marked interacinous infiltration with the same type of cell. There were also large islands of packed masses of these cells present. Kidney: Sections showed an infiltration around the tubules, and there were also small masses of cells of the same character. Bone marrow consisted of a crowded uniform mass of cells as described above. Amongst them there were only a few erythroblasts and some fat tissue.

Discussion.

Dr. Knyvett Gordon, who kindly examined for us some sections, expressed his opinion that in view of the uniformity of cells he would regard it as lymphosarcoma. Dr. Parkes Weber, to whom we are very much indebted for his keen interest in the case, thought it to be a case of lymphatic leukæmia. In our opinion these two views are not contradictory, but lend support to our conception regarding the relationship between lymphosarcoma and leukæmia.

The patient had a generalised enlargement of glands for very many years. We assume that it was a case of benign aleukæmic lymphadenosis. The

blood-picture when we first saw him was still normal. The histological picture of the gland dissected in vivo excluded the possibility of a previous existence of Hodgkin's disease. Such cases with an acute "poussée" are met with frequently in literature, but they are generally characterised by the appearance of large cells in the tissues and in the blood.

The most striking feature of this case was the uniformity of small lymphocytes found in all organs, and in the mediastinal and retroperitoneal glandular masses. Dr. Knyvett Gordon rightly remarked that this structure resembled more the type usually described as lymphosarcoma, but that "the essential feature of lymphatic leukæmia is a mixture of lymphoid cells ranging from small lymphocytes through large lymphocytes and lymphoblasts and up to the primitive lymphoidocyte."

The problem is somewhat similar to that of "leukosarcoma" of Sternberg. This author described cases with tumour-like infiltrating growths, especially mediastinal, mostly associated with a leukæmic blood-picture. The cells characterising his cases (just as the cases of Parkes Weber,[4] Scherf,[5] &c.) were of the large type in the blood and also all organs, and the tumour-like masses were permeated by the same type of large lymphocytes. Sternberg considered these cases as distinct from ordinary lymphatic leukæmia, and separated them together with the chloromatosis into a distinct group termed "leukosarcomatosis."

This classification, however, has not been accepted by the majority of hæmatologists. Naegeli,[6] e.g., points out that it is erroneous to consider the large cells, as Sternberg does, as tumour cells, since similar histological pictures are frequently met with in ordinary leukæmias, especially those with an acute course. Pappenheim[2] says that the uniformity of these large cells is due only to the acute precipitated maturation of the cells. He considers also the small-celled lymphosarcomatosis of Kundrat as a variety of "the leukæmic and aleukæmic parenchymatous diseases of the hæmatopoietic tissues" only, and speaking of Sternberg's leukosarcoma he points out that there are not only large, but also small, celled diseases of that type. The generalised benign hyperplastic, as well as the primary malignant diseases of the hæmatopoietic system, are, in his opinion, manifestations of the same pathological process. There is, moreover, only a gradation in the biological "avidity" of the cells, and the malignant type (Pappenheim calls it sarcoid type) shows, in addition to the primary multiple proliferations, also secondary embolic metastases due to an overflow from the rapidly proliferating primary lesions.

Our case showed a general enlargement of glands, and several of them from different parts of the body when examined exhibited the same histological structure. The spleen, liver, kidneys, and bone marrow were found to be infiltrated with the same type of cells. Dr. Knyvett Gordon is further of opinion that the changes in the liver, kidneys, and bone marrow were due to metastases, but this is difficult to prove, and in our view the generalisation of the same type of cell indicates only a primary generalised affection of the hæmatopoietic tissues.

It was very instructive to watch the development of changes in the patient's blood. When we first examined it, the total as well as the relative number of white cells was completely normal. Then a relative lymphocythæmia appeared, with a majority of small lymphocytes. There was also a considerable number of myelocytes present. With the development of the disease the relative number of lymphocytes increased steadily till ten days before the patient's death we got a total count of 60,000 white cells and a differential count of 87½ per cent. lymphocytes, of which the great majority consisted of small lymphocytes. These figures went on increasing up to the patient's death. These changes in the blood could certainly not have been an agonal manifestation, but an inherent symptom of the disease. It is interesting to note that the red cells remained normal and were only slightly affected just before death.

The usual symptoms met with in acute leukæmia—i.e., stomatitis, high temperature, and hæmorrhages—were not of a very marked character. It is interesting to note that Sternberg[7] considers these symptoms as having nothing in common with the leukæmic process itself, but as being due to septicæmia caused by a secondary infection.

Our case gives, in our opinion, a very good illustration of the relationship between lymphosarcoma and lymphadenosis (leukæmic and aleukæmic). Lymphosarcoma, as originally described by Kundrat and Paltauf, is a localised affection of a group of lymphatic glands, never generalised, but infiltrating surrounding tissues and spreading by way of the lymphatics into the neighbouring groups of glands. The penetration into the tissues in the case of a lymphosarcoma is different from that in true sarcoma or cancer. Here the cells never destroy muscles or vessels, but infiltrate the tissues in the same way as in some cases of ordinary leukæmia. For example, vessels are surrounded by the cells, the walls are infiltrated, but the lumen remains free. The infiltrated organs preserve their function and atrophy only late (Rieux).

Spleen and liver are rarely affected. The opinion of authors about the character of blood changes varies; some find a relative lymphocythæmia, others a relative diminution of lymphocytes. The total amount of white cells is in most cases not affected. There are thus usually no marked changes in the blood, and for that reason alone would our case also be quite remarkable. The histological structure of the affected tissues in lymphosarcoma shows an extraordinary proliferation of lymphocytic cells, which are pressed tightly against each other. The cells are uniform in character and mostly of the small lymyphocyte type, but the nuclei have frequently a vesicular aspect and are surrounded by a narrow margin of cytoplasm. There is but little reticular stroma present. There are thus only differences in degree of infiltration between lymphosarcoma and leukæmic and aleukæmic lymphadenosis, while the uniformity of cells makes the position of lymphosarcoma similar to that of Sternberg's leukosarcoma.

A characteristic feature of lymphosarcoma is its limited localisation. But just as myelomas, which are considered by Pappenheim[2] as belonging to the same group of primary diseases of the hæmatopoietic tissue, may be localised or generalised—i.e., associated with a general affection of glands and the spleen (Lubarsch)—so also lymphosarcoma may occur in a localised and a primary generalised form. Hirschfeld[8] mentions such a primary generalised case of lymphosarcoma.

While speaking of the generalised and localised forms we must emphasise that in our opinion even ordinary leukæmia does not commence suddenly as such in a generalised form, but that it is preceded by a shorter or longer period of latency, and probably begins first under the influence of some irritating agent in a group of glands or in the spleen and only gradually becomes generalised.

In Rieux's[1] opinion aleukæmic lymphadenosis and lymphosarcomatosis cannot be separated from each other, because their fundamental basis is the same. He considers the histological differences between them as not of great importance. The essential feature in both is the hyperplastic proliferation of lymphocytes, and there is only a difference in degree of aggressivity between these two clinical forms. In the ordinary form of lymphatic leukæmia the proliferation of cells is often not limited to the glandular structures from which they originate, but they infiltrate the capsule as well as the surrounding tissues. This feature of leukæmia was the reason why Banti[9] regarded it as sarcoma. Ribbert,[10] who looked also upon leukæmia as a generalised neoplasm, did not accept the term sarcoma for it, because he reserved this definition for tumours originating from connective tissue. He thus termed cases with a proliferation of young large cells as lymphoblastoma, while for

tumours characterised by small riper cells he used the term lymphocytoma.

A very interesting point of view is taken by Jolly.[11] He states that those cases of leukæmic and aleukæmic lymphadenosis which show a predominance of a certain type of cell have an aspect similar to the round-celled sarcoma. The difference would lie mostly in the absence of reticular stroma in the case of the latter.

If we take into consideration that many modern hæmatologists like Ferrata,[12] find evidence indicating a relationship between the connective tissue cells and the cells in leukæmic proliferation, this view would not appear unfounded. Fineman[13] points out that in his case of microlymphoidocytic leukæmia he found in the tissues all the morphological stages of metaplasia from a connective tissue cell to his microlymphoidocyte. To quote his words: "There are typical elongated connective tissue cells with the clear, pale, almost homogeneous cytoplasmic processus and vesicular pale nuclei. The next cell in the process shows a shortening of these processus. Then, again, a cell may be completely rounded out or oval in shape." If this be so, one would be rather inclined to consider sarcoma and the leukæmic and aleukæmic proliferation as very closely related to each other.

But any attempt at classification must bear here a temporary character as long as the ætiology of both leukæmic diseases and sarcoma remain unknown. We may come with Jolly[11] to the conclusion that "leukæmias represent pathological appearances intermediary between hyperplastic and neoplastic reactions, and their study may thus be able to throw also some light upon the pathogenesis of malignant tumours."

Conclusions.

The points of interest in the case described above are: 1. A benign aleukæmic lymphadenosis with a history of many years takes suddenly the form of a malignant lymphadenosis. 2. The uniform character of cells, corresponding with the histological picture of lymphosarcoma. 3. The generalised character of this malignant process. 4. The change of the aleukæmic blood-picture into a leukæmic one. 5. Evidence of relationship between leukæmia and lymphosarcoma.

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FISHERMEN AND ABERDEEN ROYAL INFIRMARY.—Fishermen of Fraserburgh have undertaken to contribute 30s. per boat per annum for the next three years in response to the appeal for the proposed new Royal Infirmary at Aberdeen.

ST. BARTHOLOMEW'S HOSPITAL.—Lord Stanmore, the treasurer, reports the excess of total income over expenditure for last year as £9465. Expenditure amounted to £191,648, and the number of in-patients dealt with was 9,802, while 666 out of 688 beds were in constant use. During the year close on 3000 cases of street accidents or illness were brought in by motor ambulances belonging to the Corporation or the London County Council. Lord Stanmore refers to the scheme for the erection of an operation theatre block, a new surgical ward block, and recreation rooms for the nursing staff, at a cost of £200,000.

CONGENITAL HYPERTROPHIC STENOSIS OF THE PYLORUS.

THE RESULTS OF RAMMSTEDT'S OPERATION.

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THE immediate problem to be faced in these cases is how best to tide the infant over the period during which the obstruction of the outlet of the stomach is threatenening life by starvation. As to whether this should be effected by medical measures alone or whether surgical interference is justified is still a matter on which there is considerable diversity of opinion. The question can ultimately be decided on experience and statistical study of the results obtained by either method, but the disease is relatively rare, and, furthermore, suitable surgical treatment has only been applied to it during the last few years. Groups of statistics still show great variations in the results achieved by both methods, for these depend more on the environment of the patient than on the disease, for early and prompt diagnosis is the first essential to successful treatment whether by medical or surgical measures. This is well shown in the cases in this series, in which the mortality in the private cases is nil, whilst in "hospital" cases treated by exactly the same methods it is 48 per cent. For statistics to be comparable they must be of cases drawn from the same strata of the population and, if possible, from the same neighbourhood. Early diagnosis and prompt treatment would appear to favour the surgical results to a greater degree than the medical ones in comparable groups of cases, for in selected cases the surgical mortality is probably not more than 5 per cent.; moreover, where the mortalities in the two groups of cases equal, there appear to be some inherent disadvantages in treatment by medical measures alone. Cases so treated demand months of highly skilled nursing, with most meticulous attention to every detail of diet and hygiene, with its attendant anxieties and strain. With surgical treatment the time required is much shorter, and in the course of two or three weeks, as a rule, the child is fit to return to its mother in an ordinary home—in not a few cases in this series the infant has returned home before the tenth day. The degree of obstruction undoubtedly varies in different cases, and there is no method of diagnosing this accurately early in the course of a case; were it possible to do this it might be feasible to suggest medical treatment alone for the slighter cases and reserve operation for the higher degrees of obstruction. To try medical treatment at first and then change to operation at a later stage, when the child has gone further downhill, is to court disaster in the average case. As far as can be ascertained, cases that have recovered, whether treated medically or surgically, grow into healthy children free from digestive troubles, but such study of cases has not been sufficiently prolonged to be certain of the end-results. Undoubted cases are on record in which adults have been found suffering from obstruction due to hypertrophy of the circular fibres of the pyloric musculature; such cases may be lesser degrees of the infantile condition which have survived to adult life. It is not unreasonable to suppose that cases cured by medical means alone may add to the number of such adult cases. Operation by division of the muscle and herniation of the mucosa would appear likely to avoid the risk of incompetence of the pyloric canal developing later.

The cases in this series, 90 in number, were, almost without exception, all admitted under the care of my colleague Dr. Leonard Parsons, and he has been responsible for the diagnosis and the pre- and post-operative treatment. With one exception, all of the cases have been operated on in the Birmingham Children's Hospital, the private patients being admitted into the paying wards of the hospital.

From the time the series starts in 1919 it has been his rule to have treated by operation all cases of the disease admitted under him, and many of the patients were extremely wasted and ill, and very poor operative risks, even for this disease. Two cases died during the short period of preparation elapsing between admission and operation. Diagnosis was made on clinical findings, supplemented in a certain number of cases by the X ray examination. The latter is not now used as a routine, though for a period it was used regularly. It is somewhat upsetting to the infant and is not necessary to establish the diagnosis. In two cases the diagnosis was at fault; in one, early in the series, the child had pylorospasm only and recovered, in the second case the child had a pyloric stenosis without hypertrophy, and accompanying this was a stenosis of the duodenum—it died. As a rule, before operation the infant has a few days' treatment in hospital, with rectal and stomach lavage daily, and immediately before going to the theatre a subcutaneous saline is given.

The Anæsthetic.

In the majority of the cases nitrous oxide and oxygen has been used, and it is now the anæsthetic of choice. It is less toxic than a mixture of ether and chloroform used in the early cases. The latter was frequently followed by hyperpyrexia, whereas with nitrous oxide, though a temperature of 100° F. is occasionally seen, as a rule no reaction occurs, and the child quickly recovers. Its administration requires great skill, and I have to thank Dr. Harry Featherstone for his assistance with these cases. Relaxation of the abdominal wall is good as a rule, though occasionally a little ether may be necessary to supplement the nitrous oxide to attain this. In the series of 90 cases, 36 died, a mortality of 40 per cent.

Mortality in Private and Hospital Cases Compared.

As has been frequently noted by all observers, the mortality of the private cases is considerably less than that of those from the hospital class. The relative proportions of these two types of case is a point which must be borne in mind when judging statistical results. In the present series there were 15 private cases, and all of these made good recoveries. If we deduct these cases, the mortality amongst the 75 hospital cases was 48 per cent.

Several explanations have been offered as to the cause of the strikingly different mortalities of the hospital and private cases. That it is not due to the unfavourable results of treatment in an institution as opposed to treatment under home conditions, is shown by the present series, in which private and hospital cases were (with one exception) all treated in the same institution though in different wards. In every way the nursing and medical care of the two groups was comparable, except that, as a rule, the number of patients at a given time would be greater in the public than the private wards, and it is possible that this may have played some part in bringing about the striking difference between the two groups, looking to the susceptibility of these children to enteric infections in the post-operative period. Such infections are known to spread if the number of infants in a unit is proportionally high. A more likely explanation of the difference between the two groups is the relatively earlier diagnosis in the private cases, and this, as has already been stated, is the key to successful surgical treatment. Thus in a group of private cases the average time which symptoms had existed before operation was 13 days, in a comparable group of hospital cases it was 18 days for cured cases and 25 days for cases that died. The importance of these figures becomes manifest when we realise that these infants often lose 1 per cent. of their body-weight each day that treatment is delayed.

Rammstedt's Operation: Its Results.

Rammstedt's operation is simple and efficient, it can be carried out speedily, and causes little operative trauma. Briefly, it consists of a longitudinal incision into the thickened pylorus. By this the thickened circular muscle-fibres are divided right down to the mucosa, thus allowing the mucosa which is tightly infolded in the grip of the muscle to expand and fill the gap in the incised muscle. By this means the pyloric canal becomes competent to allow the stomach contents to pass. The risks of the operation are: (1) operative shock; (2) hæmorrhage; (3) perforation of the mucosa of stomach or duodenum; and (4) inadequate freeing of the mucosa.

Of the 36 cases which were fatal, 14 died within 24 hours of operation, and in four of these cases bleeding from the divided muscle was the cause of death, and in the other ten patients no cause could be found other than inanition and the shock of operation. These cases were all desperately bad beforehand and unable to survive even the slight trauma inflicted. Looking over the histories of the ten cases, it may be fairly said that they were too late to survive with any form of treatment, as it is a striking fact that in this group the average time during which symptoms had existed was no less than 50 days, which is double that of the average fatal case, and three times that of the cases which recovered. Every precaution must be taken to eliminate shock by speed in operating—suitable anæsthesia, warmth before, during, and after operation, and by subcutaneous and rectal salines before operation and after returning from the theatre. Even with such precautions such late cases will have a heavy mortality, though occasionally one recovers even when every factor is against this in late diagnosis and severe inanition. Thus one case in which symptoms had been present for 45 days and the patient had lost 25 per cent. of the birth weight (7½ lb.) made a good recovery and left hospital in under three weeks.

In the majority of the cases the hypertrophied pylorus is relatively avascular, and oozing from the divided margins is not troublesome; in occasional cases there is troublesome oozing or bleeding from a minute vessel in the subserous coat. The loss of four cases in this series from hæmorrhage indicates the danger from this source, a danger which was insufficiently realised in the earlier cases. The tissues are so fragile that it is almost impossible to deal with the bleeding-point by ligation, though this may sometimes be possible. Further danger is to be feared from hæmorrhage occurring from the margins of the incision during the period of reaction following the operation, though hæmostasis may appear to be perfect when the abdomen is closed.

With nitrous oxide anæsthesia the necessity for speed in operating is not so great as formerly and more time can be spent in attention to the detail of hæmostasis. A fragment of the rectus muscle taken from the margin of the wound, and applied by steady pressure for one minute to the bleeding area, has been the most successful hæmostatic in my hands. One of the more obvious risks of the procedure is perforation of the gastric or duodenal mucosa in the depths of the incision. This can be obviated by care in dividing the muscle and by the recognition of the sudden thinning of the hypertrophied muscle at the duodenal end of the canal. There were no deaths from this cause in the present series.

When the operation is completed the incision must gape widely and the mucosa be freely herniated through the gap; the muscle itself is very loosely attached to the underlying mucosa and is very brittle and easily divided by a blunt instrument; it is easy, however, to overlook a few circular strands of very tough fibres lying next to the mucosa. If left undivided these restrict herniation and may be responsible for allowing scar formation to close up the canal if the child survives a few weeks. In such cases the child makes a bad recovery or dies some weeks after operation with symptoms of stenosis, manifest by vomiting, reappearing a fortnight or so after operation.

Cases which survive the immediate risks of operation still require the greatest care in the post-operative

period. As a rule, the length of this period bears a direct relationship to the length of time the symptoms have existed before operation. The chronic gastritis and hugely dilated stomach resolve but slowly; whilst the atrophic intestine is ill-adapted to resume function at once. Many deaths occur in this post-operative period from the third to as late as the fiftieth day. If breast milk is available the risks of this period are definitely lessened by its use. All forms of artificial feeding appear to be attended with increased risk, though the use of lactic acid milk appears to be attended with less danger than other substitutes. Not a few of the cases have a terminal diarrhœa with green stools. In others steady loss of weight occurs and the child gradually fades out. A too rapid increase of diet, although it is attended by a satisfactory rise in the weight at first, carries with it the risk of an enteritis from non-absorption caused by the great atrophy of the small intestine which is present. This atrophy takes two or three weeks to adjust itself to the new conditions resulting from the opening of the pylorus. Cases that run a favourable post-operative course often gain no weight for the first fortnight, a slight loss in the three days following operation is followed by a period during which the weight is maintained, and then the weight begins to increase very slowly—at the end of a fortnight the weight at the time of operation is reached—onwards from that time the rate of increase may be allowed to accelerate more rapidly. As a general rule, cases which come to operation within a week or two of the onset of symptoms have a quiet convalescence, whereas cases in which the operation is late cause constant anxiety owing to the gastritis and intestinal atrophy which is present, and not a few of these die some weeks after operation from these causes.

Conclusions.

1. All cases admitted to one hospital unit during the years 1919-26 were submitted to Rammstedt's operation. The mortality in 90 cases was 40 per cent. 2. Included in the series were 15 private cases. None of these died. 3. The great difference in mortality-rates in the "hospital" and "private" cases is mainly due to earlier diagnosis in the latter cases. 4. If all cases of the disease could be operated on within 14 days of the onset of symptoms, the mortality would probably not be more than 5 per cent.

AN OUTBREAK OF ILLNESS CAUSED BY *B. DYSENTERIÆ* FLEXNER.

BY S. H. WARREN, M.R.C.S. ENG., D.P.H. LOND.

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THE following outbreak, at first regarded as food poisoning, proved to be due to infection with *B. dysenteriæ* Flexner and, unlike the sudden explosion of illness usually met with in food poisoning, consisted of a series of cases separated by intervals of a few days. A very careful inquiry into the sources of the foodstuffs ingested was made by the health authorities at the time, and no evidence tending to incriminate any particular item could be obtained, although a sample of tomatoes, which fell to some degree under suspicion, was sent to the laboratory for examination and a proteus-like organism was isolated therefrom.

History of the Outbreak.

The illness was entirely confined to two families who lived together in a two-roomed flat, sharing the same scullery and w.c., but cooking and eating separately. The larger family (M.) consisted of father, mother, and three young children, of whom the three children alone were affected, and of these two died. The second family (B.) consisted of an aged man and an adult daughter; the former suffered from diarrhœa and was found to be passing the same dysentery bacillus while the latter showed no evidence of infection.

The first case, J. J. M., aged 6, was taken ill on July 2nd with abdominal pains, desire to defæcate, and vomiting, followed later by diarrhœa with foul-smelling, greenish-yellow stools. He died on the 4th, having been seen by a doctor for the first time a few minutes previously. No bacteriological examination was carried out in this instance.

The second case, T. W. M., aged 2, was taken ill on the afternoon on July 5th, the day following his brother's death, with a sudden attack of abdominal pain, followed by diarrhœa, and just before death, which occurred next day, by vomiting. A post-mortem examination, held on the 6th, showed redness and inflammation of the mucous membrane of the large intestine throughout its entire length, its contents consisting of mucus and thin yellow fluid. Slight injection of the stomach and the lower end of the ileum, with enlargement of Peyer's patches and the solitary follicles, was also noted. This child was said to have suffered from diarrhœa 18 months previously. The brain, spleen, liver, stomach, and intestine were received at the laboratory on the 7th, and the strain of *B. dysenteriæ* Flexner to be described was isolated from all of these organs.

The third case, R. M., aged 5, the remaining brother, was taken ill on the evening of July 9th, or four days after the onset of illness in the second case. He suffered from diarrhœa and the mother stated that there was blood and mucus in the stools, an observation later confirmed in hospital. He appears to have suffered a comparatively mild attack and subsequently recovered. This boy's fæces were examined, as were also those of the rest of the family on the 8th, the day before his attack began, and the dysentery bacillus was isolated, but other specimens four and 18 days later were negative. His blood, when tested on the 19th, agglutinated both his own organisms and also the X strain of *B. flexner* up to 1 in 250, and the Z strain of *B. flexner* to 1 in 125.

The fourth case, Mr. B., aged 70, suffered merely from an attack of diarrhœa on July 11th (two days after Case 3), and his fæces, examined next day, yielded the same organism, although negative later on the 28th. He was treated by a doctor, being put to bed, and recovered. His blood agglutinated on the 22nd 1 in 125 to the X and Z strains of *B. dysenteriæ* Flexner, and also the organism recovered on the 13th. His fæces when examined seven months after the outbreak were free from dysentery bacilli.

Members of the two families who showed no signs of infection.—The fæces of Mrs. M., aged 32, the mother of the family, were examined on July 8th with negative result, but when the examination was repeated 20 days later the same strain of *B. dysenteriæ* was once more isolated. Her blood also agglutinated the X and Z strains of *B. dysenteriæ* Flexner to 1 in 25 on the 19th. The fæces examined seven months after the outbreak were free from dysentery bacilli. Examination of the fæces of Mr. M., the father, proved negative on two occasions, but his blood on the 19th agglutinated *B. flexner* X to 1 in 50 and Z to 1 in 12½. Lastly, the remaining member of the two families, A. B., aged 25, gave entirely negative results in two examinations of her stools, and her blood was not examined.

Summary.

It will be seen, therefore, that of seven people involved in these two families, four were infected with a Flexner dysentery bacillus. In one case the organism was recovered post mortem, and from the other three from the stools during life. Further, the bloods of all four agglutinated the organism recovered as well as standard strains of *B. dysenteriæ* Flexner. In all except the two fatal cases the bloods were examined for the presence of agglutinins of *B. ent.* Gaertner, *B.* aertrycke (Mutton and Nenport), but always with negative results.

The bacillus isolated from all these sources invariably gave the reactions and showed the general characters of *B. dysenteriæ* Flexner. When tested against the Oxford Flexner type sera they gave the uniformly similar results recorded in the following table:—

Strain ..	1 in 25	1 in 50	1 in 125	1 in 250	1 in 500	Control.
Serum V ..	+	±	−	−	−	−
„ W ..	−	−	−	−	−	−
„ X ..	+	+	+	+	±	−
„ Y ..	+	±	−	−	−	−
„ Z ..	+	+	+	+	±	−

Repeated absorption experiments were subsequently carried out with anti-sera prepared in this laboratory from the organism isolated and from different strains

of *B. dysenteriæ* Flexner types X and Z, and also with sera obtained elsewhere, but no clear-cut results were ever obtained, and the results all pointed to a considerable admixture of both types in the structure of the organism isolated.

Discussion.

Although this outbreak cannot be regarded as "food poisoning" in the strict sense of the term, or comparable to the instances of the sort quoted by Savage and Bruce White as due to the dysentery group of organisms, food cannot be precluded as a possible vehicle of infection. It was not possible actually to determine the primary source of infection, but, as Nabarro suggests, the dysentery infections may be much more frequent in this country than is commonly supposed. We have actually isolated several strains of Flexner dysentery bacilli from the stools of children suffering from diarrhœa as patients of the Children's Hospital here.

In this instance no definite history of dysentery could be obtained. One child (Case 2) is said to have suffered from diarrhœa 18 months previously, the cause of which is unknown. Mr. M. had not served in the army or been abroad. Mr. B. had been a sailor but only on local fishing boats and had not visited foreign ports. Mrs. M. was at least a temporary carrier as the organism was isolated from her stools on one occasion, about 14 days after the cases started, but she appeared to remain well. No doubt in the confined condition under which these families lived there was ample opportunity, using the same scullery and w.c., assisted probably by flies, for both families to become infected.

As regards the finding of the dysentery bacillus in all the tissues of Case 2, it is the universally accepted experience that dysentery bacilli hardly ever invade the blood stream and can rarely be isolated from the solid organs post mortem. The writer was not present at the autopsy, but the organs were sent to the laboratory later in separate vessels. The usual preliminaries of sealing, &c., were carefully carried out.

The outbreak showed this dysentery bacillus to be specially virulent for children and the aged, and it was actually fatal to two children after a very short illness. Full grown adults appeared not to be affected. Finally, the diagnosis as to the cause of the outbreak was only possible as a result of fairly extensive bacteriological investigation.

I wish to express my indebtedness and thanks to Dr. H. KERR, medical officer of health, Newcastle-upon-Tyne, for the clinical history and the specimens for examination in this investigation.

OBSERVATIONS ON THE SCHULTZ-CHARLTON REACTION.

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IN carrying out these investigations with scarlet fever antitoxic sera it has been assumed that the Schultz-Charlton reaction provides a reliable indication as to the therapeutic value of the serum. But before dealing with this aspect there are some points with regard to the test which may be of interest.

First, as to the amount of the injection; it has been the custom to inject 0·2 c.cm., but it was thought possible that better results might be obtained if a larger quantity were used, especially in reducing the percentage of cases of scarlet fever which fail to give the Schultz-Charlton reaction. With this object in view a number of patients were given two injections of a serum (or two sera), the first injection being 0·2 c.cm., the second 0·5 or 1·0 c.cm. In each instance the reactions were all positive or all negative. In those cases which gave positive results the areas of blanching caused by the larger injection were increased, but not proportionately to the difference in the amount. In other words, increasing the quantity of serum does not increase the probability of blanching, and though it causes no more inconvenience to the patient there does not appear to be any advantage in it.

Secondly, with reference to the strength of serum; when the test is being used for diagnostic purposes, undiluted or a 1 in 10 serum gives the best results. It is more common to find patches of erythema in the blanched areas than with higher dilutions, but this erythema fades in the majority of cases within 24 hours. A larger percentage of positive reactions is obtained than with higher dilutions and blanching usually appears earlier by several hours.

The action of scarlet fever antitoxic serum injected intradermally was demonstrated in the following manner.

A patient, injected on the first day of the rash, showed large areas of complete blanching (2 in. by 1½ in.). Three days after the test—i.e., on the fourth day of the rash (and fifth day of disease), Dick toxin and control were injected intradermally in two blanched areas. In addition, Dick toxin and control were also injected where the rash was still prominent. Twenty-four hours later the Dick toxin injected into the rash produced an area of intense erythema (1 in. by ½ in.), showing distinctly through the rash, and which lasted for three days. No such reaction occurred in the blanched areas. This test was repeated on another patient with similar result. Thus the serum injected was more than sufficient to neutralise the toxin causing the rash, if this is the explanation of the reaction. In this connexion absence of desquamation in the blanched areas, when the latter persist until the rash fades, has been observed in a number of cases.

In estimating the therapeutic value of scarlet fever antitoxic sera by means of the Schultz-Charlton reaction, the degree or intensity of blanching and the dilution of the serum must be taken into consideration. In many cases the blanching is never complete, the rash being only partially obliterated, and this type is usually evanescent. In another group of cases the blanching is complete but is gradually encroached on by the rash and eventually disappears. In a third group the blanching is complete and the area and intensity remain undiminished until the rash fades. I take this to mean that in the first group the antitoxin is insufficient to neutralise the toxin causing the rash; in the second that it is only just sufficient, and in the third that it not only neutralises the toxin present at the time, but also any subsequently invading the area from the blood stream or injected intradermally.

With regard to dilution, two sera may give practically the same results until high dilutions are employed when the difference in potency becomes apparent.

By making these observations sera from different strains have been compared and the advantage of using concentrated sera has been shown. In one series of cases concentrated serum gave good results when diluted 1 in 16,000, but no blanching could be obtained with the unconcentrated beyond 1 in 8000. The central erythema, already referred to, was found to occur with about equal frequency with concentrated and unconcentrated sera, which would suggest that it is not a protein reaction. True serum rashes do occur in the form of urticarial weals confined to the blanched area three to four days after the injection.

These observations were made in a series of 132 cases, in 97 (72·5 per cent.) of which there was blanching. In my previous series[1] of 168 cases, 72·6 per cent. reacted. Thus there are some 37 per cent. of cases of undoubted scarlet fever which failed to blanch with specific sera. But in considering these figures it must be pointed out that in a number of

[1] Metropolitan Asylums Board Annual Report, 1925–26, p. 171.

cases only high dilutions were used. If only those cases are taken which were injected with undiluted or 1 in 10 serum, the percentage of negatives falls to 22 per cent. Another factor to be borne in mind is the "age" of the rash. A rash that has been present three days is less likely to react than on its first appearance. The actual figures in this series are as follows:—

1st day rashes ..	..	83·3 per cent. positive.
2nd " " ..	..	75·0 " "
3rd " " ..	..	50·0 " "

All cases tested on the fourth day were negative, and it seems probable that the reaction can very rarely be obtained on or after the fourth day. The average interval before blanching occurred was 14¼ hours, the shortest time being 6½ hours. In two cases blanching did not occur until at least 36 hours after the injection. Normal horse serum was used as a control in amounts varying from 0·2 to 1·0 c.cm. in 17 cases, and no blanching occurred.

Non-Specific Sera.

In February last, at the suggestion of Dr. R. A. O'Brien, we started using non-specific sera for the Schultz-Charlton reaction. The sera used were prepared from the streptococci of erysipelas, puerperal fever, cellulitis, and from a case of streptococcal toxæmia. The results were surprising. The following table gives some of the results. In each case the various sera used were injected at the same time.

Case No.	Sc. fever antitoxic serum. Dil. 1 in 10.	Puerperal serum.	"Cellulitis" serum.	"Erysipelas" serum.	"Streptococcal" toxæmia serum.	Multivalent antistrept. serum.
5	Pos.	Neg.	Neg.	Pos.	—	—
7	V. sl. reac.	"	"	"	—	—
11	Pos.	"	—	—	Pos.	Pos.
12	"	"	—	—	"	"
13	"	"	—	V. sl. reac.	—	"
17	"	Pos.	—	—	Neg.	"
18	"	"	—	—	—	—
20	"	"	—	—	—	—
23	Neg.*	Pos. (*undil.*)	Neg.	—	—	Neg.*
28	Pos.	Pos.	Pos.	Pos.	—	—

V. sl. reac. = Very slight reaction. * 1 in 10.

A scarlet fever serum, known to give good results, was used in each case as a control, and in no instance up to the present has this control failed to blanch when reactions have been obtained with non-specific sera. On the contrary the scarlet fever serum has in most cases produced larger areas. From the table above it will be observed that multivalent anti-streptococcal serum was used. This naturally suggested itself when reactions had been obtained with several of the non-specific sera. The areas it produced were much larger than those of the control (sc. fever) serum when used undiluted, but when it was diluted 1 in 10 the areas were slightly smaller than those of the control.

This multivalent serum was prepared from numerous strains of streptococci which included two strains of scarlet fever streptococcus, and was taken from horses which had previously been immunised against scarlet fever toxin. If at some future date we find a number of cases reacting to a serum non-specific to scarlet fever, and not to scarlatinal antitoxic serum, further investigation of these cases may provide valuable information on the ætiology of scarlet fever.

ROYAL NORTHERN HOSPITALS.—The total income for maintenance of the Royal Northern group of Hospitals last year amounted to £81,454, as against £85,859 the year before. The total maintenance expenditure increased from £86,596 to £89,232, but this was partly due to the increased number of patients and partly to an additional 21,852 out-patients' attendances. An indication of the progress of the hospital is seen in the increase in the total income of the hospital, which in 1913 was only £24,608.

Clinical and Laboratory Notes.

A CASE OF MULTIPLE DIVERTICULA OF THE JEJUNUM.

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VERY few examples of diverticula of the jejunum have been placed on record. James T. Case,[1] writing on diverticula of the small intestine other than Meckel's diverticulum, collected only 17 cases recorded between 1854 and 1920. Helvestine,[2] writing two years later, refers to 27 cases of false diverticula of the jejunum. In view of their apparent rarity in the small intestine the following record appears to be worthy of publication.

A man, aged 70, was admitted to hospital in August, 1920, suffering from the effects of prostatic obstruction, and died from uræmia. A history was obtained, in addition to his urinary symptoms, of some digestive trouble which was described as flatulence, and multiple diverticula of the small intestine were discovered at autopsy. The small intestine—with the exception of the duodenum, which was free from diverticula—was removed and measured 6·3 metres in length. There were upwards of 50 diverticula, and they were limited to the first 2 metres of the intestine, the rest of which showed no abnormality. They were divisible into two groups, large and small, and there were very few of intermediate size. Small diverticula occurred throughout the whole length, but the large ones were limited to a distance of less than the first metre, except for a solitary large one which occurred, as a last example of the condition, 2 metres from the duodeno-jejunal flexure.

The first diverticulum arose from the mesenteric attachment about 25 cm. from the duodeno-jejunal flexure, and then projected forwards on the right side of the gut, to which it was bound by rather dense whitish adhesions. These could easily be freed, when it was found that the diverticulum was spheroidal in shape and communicated with the intestine by a narrow opening bounded at its margins by longitudinal muscle-fibres. The sac itself was thin-walled, covered by serosa, and measured 2·5 cm. in length and 1·5 cm. at its widest part. About 5 cm. further down was a similar but larger diverticulum about 3·75 cm. in length and about 2·5 cm. at its widest part. Another 9 cm. further on was a diverticulum of about the same size, but this time attached to the left side of the intestine. Then followed a large number of small diverticula which measured on an average about 1 cm. in all directions. These projected directly backwards into the mesentery. Up to a distance of less than 1 metre from the duodeno-jejunal flexure angle there were about half a dozen large diverticula, usually attached to the intestine on the right side. For the remainder of the distance they were all small except for the large diverticulum which terminated the series and was similar to those described in the upper part of the intestine.

At a distance of about 1·25 metres from the last diverticulum were two lipomata, each about 5 cm. in diameter, arising in and situated on either side of the mesentery, nearly opposite one another. They did not contain diverticula. On opening the intestine the stomata leading into the diverticula, large or small, were all about 1 cm. in diameter. Those diverticula that were opened were found to be empty. There was no evidence of diverticula of other organs beyond a small inflamed diverticulum of the sigmoid colon.

Discussion.

Case [1] in 1920 made the first diagnosis of this condition by means of radiological examination. E. L. Hunt and P. H. Cook,[3] writing in 1921, regarded these diverticula as relatively common, an opinion which is probably correct, and described them as roughly pear-shaped, measuring about 3 cm. in depth and 3 cm. in width. The openings into the intestine were about 1 cm. in diameter. All the diverticula went directly backwards into the mesentery.

[1] Jour. Amer. Med. Assoc., 1920, lxxv., 1463.
[2] Helvestine: Surg., Gynæcol., and Obstet., 1923, xxxvii., 1–5.
[3] Ann. Surgery, 1921, lxxiv., 746.

L. R. Braithwaite [4] described and figured a beautiful specimen of multiple diverticula of the jejunum for which enterectomy was necessary. The diagnosis had been made by Dr. L. A. Rowden after radiological examination. The diverticula extend directly backwards into the mesentery. Helvestine [2] described two cases, the first of which is strikingly similar to the one I have recorded.

The patient, aged 70, suffered from the effects of an enlarged prostate which resulted in uræmia and death. The diverticula were 58 in number, the largest in size being those nearest the duodenum. They were spheroidal in shape, and the stomata which connected the diverticula with the intestinal lumen were much smaller than the cavity of the diverticulum. This point is well illustrated in a figure which displays the intestine laid open from the antimesenteric border and shows the stomata leading into the diverticula.

Sir Berkeley Moynihan,[5] in discussing these diverticula, remarks: "The pouches may be numerous, are rarely larger than a walnut, are usually on the mesenteric side, and because of their large orifice do not, as a rule, retain food for long periods and do not, therefore, often lead to serious complications." The statement that the diverticula have a large orifice, and that this is the explanation for their not often leading to serious complications, is not borne out by the present case, nor by a number of other recorded cases in which the point is mentioned. Where the diverticula are small the orifice appears to be as large as the cavity, but as soon as the diverticulum approaches its usual maximal dimension—of something less in size than a walnut—the orifice is actually much smaller than the cavity. Typically it appears to be seldom more than 1 cm. in diameter, although in cases of perhaps long standing it is sometimes larger.

An interesting point in the present case is the fact that all the larger diverticula turned forwards and generally to the right side, obtaining secondarily an attachment by means of adhesions to the intestine itself. This does not appear to have been noted in other cases. It would seem that in the early stage of formation of the diverticulum the line of least resistance is directly backwards between the leaves of the mesentery, but as the diverticula become larger they generally tend to project much more on the right side of the mesentery than on the left, and in some instances are actually turned forwards. Their projection, as a rule, on to the right side, may possibly be explained by the oblique attachment of the mesenteric root, and the fact that resistance on the left side of the mesentery may be greater than on the right side, owing to the disposition of the coils of intestine.

Various theories have been advanced to explain the causation of these diverticula, and there can be no doubt that they do not all have the same origin. Helvestine[2] mentions three factors: (1) traction by the mesenteric vessels or traction following adhesions; (2) degeneration of the musculature; and (3) increased intra-abdominal pressure-tension, leading to increased intra-intestinal tension, in the causation of which rectal and vesical tenesmus play an important part. Prostatic retention, as in Helvestine's first case, and also in the present case, must be regarded as a very potent factor in the formation of acquired or false diverticula of the jejunum.

If the diverticula are entered by the fluid contents of the jejunum they cannot empty themselves by any contractile power of their own, for they possess in most instances very little musculature, and it is likely that emptying is brought about by the pressure of the surrounding coils of intestine in active contraction. That fluid contents do enter the diverticula is proved by radiological examination, and the emptying is a slow process.

My thanks are due to Dr. H. Nockolds for permission to record this case.

[4] Brit. Jour. Surg., 1923, xi., 184, July.
[5] Moynihan: THE LANCET, 1927, i., 1061.

A CASE OF
MENINGITIS DUE TO A HÆMOPHILIC BACILLUS.

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THE article by Dr. John F. Taylor in THE LANCET of June 25th (p. 1341) on Suppurative Arthritis Due to Hæmophilic Bacteria prompts me to publish a brief account of a recent case of suppurative meningitis due to similar organisms.

A female, aged 1 year and 3 months, in the children's ward of the hospital under the care of Dr. Donald Paterson, came to the post-mortem table 19 days after admission. Permission to examine the head only was given by the relatives. On examination, pallor and well-marked carpopedal spasm were present. The skull bones were greatly engorged, particularly the inner table, and the dura mater fairly firmly adherent to the brain tissue beneath. This adhesion had been caused by the presence of a thick layer of deep yellow-green pus which was plastered over the entire vertex and base of the brain. The pus was plastered on so thickly that in many places the normal contour of the sulci and convolutions was obliterated. The greenish-yellow colour of the pus mingling with the bright red colour produced by the vascular engorgement gave to the brain, when viewed *in situ*, a most striking marbled appearance. Pus was present in both the ventricles of the brain, but not to any marked degree. Middle ears and other sinuses that could be examined from within the skull showed nothing abnormal. The meningeal pus contained minute "influenza-like" bacilli.

Three samples of cerebro-spinal fluid sent to the laboratory for examination on the third, fifth, and seventeenth days after admission were all more or less similar in character, save that the last was very much more purulent than the other samples. The leucocytes of the first sample numbered 208 per c.mm., about 40 per cent. of them being polymorphonuclears, and there was only a light purulent coagulum. The last sample contained a large purulent deposit (leucocytes not enumerated) of an entirely polymorphonuclear type. All samples contained large numbers of a minute pleomorphic, Gram-negative bacillus. Visible growth was only obtained on blood-agar (4 per cent. of whole blood), and then only after 48 hours. The growth was fairly copious, and consisted of minute transparent colonies, like small watery streptococcal colonies, and these were non-hæmolytic. Morphologically, the bacilli were more pleomorphic in culture than in the direct films from the cerebro-spinal fluid. In the films the bacilli appeared as minute rods of varying length, and also as cocco-bacillary forms. In the cultures, in addition to these shapes and sizes, one encountered filamentous forms. In some respects, therefore, morphologically, the bacillus resembles the *Bacillus influenzæ*, but the tendency to filament formation is more marked.

With the greatest difficulty one set of subcultures was obtained on blood-agar, and an emulsion from one of these tubes was made. The emulsion was not actually counted, but it was approximately 1000 millions per c.cm. by opacity; 1 c.cm. of this emulsion (approximately 1000 million living organisms) was injected into the peritoneal cavity of a guinea-pig of 500 g. The guinea-pig lived 28 hours and died quite suddenly, having exhibited very few symptoms of illness and eating well till the last. The peritoneal cavity of the guinea-pig was much injected, and the visceral and parietal peritoneum fairly thickly coated with a layer of yellow-green pus, very similar to that seen on the meninges of the patient. The rest of the viscera showed the usual pallor associated with a toxæmia, particularly the kidneys. The bacilli were found in the pus, but all attempts to grow them from pus or heart-blood failed.

This difficulty of keeping the organism alive in subculture or after passage through animals is in striking contrast to the behaviour of *B. influenzæ*. The organism undoubtedly is similar to those so admirably described in a paper on Meningitis Due to Hæmophilic Organisms by H. Henry,[1] to which the reader is referred for excellent microphotographs and bibliography. It would appear to be in the same class as the organism Type "Brook" he mentions.

[1] Jour. of Path and Bact., 1913, xvii., 174.

This one failed to give a blood infection in animal experiments.

With other authors, I feel bound to express a grave doubt as to these hæmophilic bacilli of meningitis or arthritis being true *B. influenzæ*. During the war, I was concerned at the Royal Herbert Hospital with investigating an enormous amount of pathological material in the pandemic of 1918–19.[2] With regard to *B. influenzæ*, the following facts stand out (1) It is readily cultivated on suitable media; (2) it grows readily in subculture and does not die out if subcultured at intervals of 4–6 days; (3) it is practically innocuous to animals. In view of my experiences of the 1918 epidemic, one other thing interests me particularly, and that is that the hæmophilic organism I now describe produces in human beings a most intense meningitis, from which the organism can be readily recognised in the cerebro-spinal fluid and pus. Now in the pandemic of 1918 the laboratory at the Royal Herbert Hospital did not receive one spinal fluid or perform one autopsy on a case of suppurative meningitis, although the case-incidence of influenza was well over 2000. A case may have been missed, but certainly meningitis must have been extraordinarily rare.

Thus on cultural grounds from animal experiments, from clinical and epidemiological evidence, I consider that the hæmophilic group of bacilli responsible for the rare cases of meningitis and arthritis, or both, which have been recorded by various authors from time to time, must be kept entirely separate from the *B. influenzæ* of Pfeiffer, with which it has only a morphological resemblance and no true relationship.

A NOTE ON
FEMORAL HERNIA IN CHILDREN.

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THE following case came under observation at the Belgrave Hospital:—

A girl, aged 4 years and 2 months, was brought to the out-patient department on account of a swelling the size of a walnut in the right groin. It was just external to the pubic spine, and below Poupart's ligament; there was an impulse on coughing, and the swelling was reducible.

At operation a vertical incision was made over the swelling and the diagnosis of femoral hernia was confirmed. The sac was opened and found to contain omentum only; this was returned into the abdomen and a radical cure was performed.

Since the condition is rare in children, it may be of interest to submit the following statistics from the records of the Belgrave Hospital during the period 1908–27. The total number of herniæ that came to operation was 1098, of which 946 (86 per cent.) were inguinal, 148 (13 per cent.) were umbilical, and 5 or 0·4 per cent. were femoral. Of these five femoral herniæ, four occurred in females. The ages ranged from 4 to 7 years. (The age-limit for admission to the Belgrave Hospital is 10 years for boys and 12 years for girls.) Four were right-sided and one was left-sided. A parallel percentage is published by Prof. José Ribera y Sans, of the Hopital l'Enfant Jesus at Madrid, who[3] states that of 3098 herniæ 14 (0·4 per cent.) were femoral.

I am indebted to Mr. C. P. G. Wakeley for permission to publish this case.

[2] Braxton Hicks and Elizabeth Gray, An Investigation of Cases of Influenza, THE LANCET, 1919, i., 419.
[3] Eleventh Congress of the Société Internationale de Chirurgie, vol. i., "Hernie de l'Enfant."

METROPOLITAN HOSPITAL.—The total income of the Metropolitan Hospital, Kingsland-road, last year was £30,338 and the total expenditure £30,332. A new nurses' home, of which the Queen recently laid the foundation stone, is being erected at a cost of over £60,000, and will accommodate 60 nurses and six sisters.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT EDINBURGH.

(*Continued from p. 394.*)

SECTION OF DISEASES OF CHILDREN.

WEDNESDAY, JULY 20TH.

THIS Section met under the presidency of Prof. JOHN FRASER (Edinburgh), and the subject of discussion on the first day was

ACUTE PNEUMONIA IN EARLY CHILDHOOD.

Dr. CHARLES MCNEIL (Edinburgh) said that for the purpose of the discussion he would use a series of 558 cases of acute pneumonia admitted to his ward during the last six and a half years. Slightly more than half the patients were under 2 years old and in these the mortality was 30 per cent., whereas in children from 2 to 12 years the mortality was 5·7 per cent.—i.e., the disease was far more common and more deadly during the first two years of life than in the succeeding years of childhood. Such facts suggested the question—What is the prevailing type in the fatal cases, lobar pneumonia or broncho-pneumonia? Dr. Agnes Macgregor had investigated this point in 100 fatal cases and had found that lobar pneumonia, as compared with broncho-pneumonia was a rare disease. As a pathological process lobar pneumonia was the simpler type; as a result of inflammation a fibrinous exudate was poured out into the alveoli, but at this stage and later the framework of the lung, including the bronchial walls, seemed to be undamaged. At the crisis a rapid resolution of the alveolar exudate took place. Alveolar pneumonia was a more accurate description of the pathological process than lobar pneumonia, and explained better its clinical course. Broncho-pneumonia, on the other hand, was a more complicated process and showed much variation in the extent and importance of the morbid changes. It addition to the varying type of exudate in the alveoli and bronchi the interstitial framework of the lungs showed inflammatory changes. Interstitial pneumonia was a better term than broncho-pneumonia, for it was the interstitial inflammation which determined the longer course of the disease, its greater immediate danger of extensive and fatal spread, and its greater risk of permanent damage to the lung tissues in fibrosis, bronchitis, and bronchiectasis. Many points were described by which the two types of pneumonia might be distinguished during life, but Dr. McNeil suggested that the cardinal differential signs were only two: the duration of fever and the rapidity of resolution. There was long fever and slow resolution in broncho-pneumonia, compared with short fever and rapid resolution in lobar pneumonia. Fever and consolidation persisting over a period of two weeks indicated broncho-pneumonia. In many cases the differential diagnosis was not difficult, but one clinical type of pneumonia which was not uncommon presented difficulty—namely, that in which there was extensive consolidation limited to one area of the lungs, the type sometimes described as "confluent broncho-pneumonia." These cases were especially frequent in the first year of life, were usually accompanied by early empyema, and could in no way be distinguished during life from broncho-pneumonia.

Dr. McNeil went on to consider reasons why pneumonia was so frequent in the hospital class of child under 2 years of age, and why it tended so often to assume the broncho-pneumonic type. He thought it possible that the causal organism might be different, but bacterial agency alone did not explain the high mortality and the incidence of the disease at a special age-period, and amongst other functions the mysterious but powerful influence of constitution might play an important part. It might be that the common agent in man, the pneumococcus, tended to produce in the lungs of the youngest children a type of inflammation which was called broncho-pneumonia; that this tendency definitely weakened after two years, but

was still evident until, say, five years, and that after that age the reaction changed to that extensive alveolar exudation with little or no interstitial inflammation which was called lobar pneumonia. The influence of a natural age-constitution was not, however, sufficient, for pneumonia was rare in healthy and well-cared-for children of any age. There must also be a deterioration of pulmonary function produced by bad environment and hygiene, and the influence of climate and season also came into play.

The Pathological Aspect.

Dr. AGNES MACGREGOR (Edinburgh) dealt with the pathological aspect of the subject. Of 100 consecutive cases of pneumonia examined post mortem at the Royal Edinburgh Hospital for Sick Children, 81 were in children under 2 years of age and 89 were cases of broncho-pneumonia; of the latter, 89 per cent. were bilateral, and 77·5 per cent. were of the confluent type and exhibited massive consolidation in at least one lobe. In lobar pneumonia the freedom of the connective tissue framework and lymphatic system of the lungs from inflammatory infiltration was a remarkable feature. There was no persistent lymphangitis, the inflammation was located in the alveoli, whose walls possessed no lymphatics. The alveolar septa showed congestion, œdema, and desquamation of epithelium, but the exudate was poured out into the alveolar spaces and the walls did not suffer disorganisation. When recovery occurred the products of inflammation were removed by resolution. There was no occasion for a process of reorganisation, with resultant permanent changes in structure and inevitable disablement of function. In broncho-pneumonia it was usual to find a large amount of inflammatory infiltration of the substance of the bronchial walls and of the alveolar walls in the centre of pneumonic patches. In the centre of an early lesion a bronchiole was present, with catarrhal contents in its lumen and inflammatory infiltration in its walls and in the peribronchial lymphatics; in the severer cases the infiltrating cells were mostly polymorphs. This area was surrounded by a group of consolidated alveoli whose walls were also infiltrated; often infiltration of the walls seemed to precede consolidation of the lumen, and extended beyond the edge of the consolidated patch. It was therefore evident that infection reached these alveolar septa through the wall of the bronchus and along the alveolar septa, and not by continuity of lumen. Acute interstitial inflammation was an essential part of the process. She believed that the existence of progressive lymphangitis in broncho-pneumonia accounted for the firm hold which the infection gained upon the lungs, and that its absence in typical lobar pneumonia favoured rapid and perfect recovery. The question whether all cases in which the features of confluent broncho-pneumonia were present at the time of death possessed those features from the outset was important in connexion with the problem of differential diagnosis of lobar and broncho-pneumonia during life, and the difficulty of placing certain cases in one or other of the two groups. It seemed not unlikely that the lymphangitis which led to broncho-pneumonia might develop either from bronchitis or from a localised patch of primary pneumonia. In certain cases of localised pneumonia of the lobar type lymphangitis might supervene as a later development, and lead to a subsequent spread of inflammation throughout the lungs after the manner of broncho-pneumonia. Such a case would be classed as confluent broncho-pneumonia at necropsy. Some fatal cases of primary pneumonia which clinically were thought to be lobar, but at autopsy were found to be confluent broncho-pneumonia, might perhaps be explained in this way. It was widely recognised that broncho-pneumonia was more apt than lobar pneumonia to cause serious damage to the lungs and to be followed by various undesirable results. Among the most important of these was suppuration, bronchiectasis, and fibrosis of the lungs. All these might be directly attributed to effects of lymphangitis.

In answering the question why the infection in broncho-pneumonia resulted in a massive invasion of the lung, Dr. Macgregor said that the most generally recognised condition which offered a possible explanation was that in these cases there were two infections, and that the primary fever was in some sense a preparation for the subsequent inroad of the pneumonia infection. The primary predisposed to the secondary infection. On the other hand, it should be recognised that in children broncho-pneumonia was often primary and without a preparatory antecedent infection. For the interpretation of these facts various suggestions had been offered postulating separately or together—(*a*) a virus of specific quality or of special virulence, and (*b*) a condition of the patient non-infective and yet preparing the way for pneumonia. In favour of the latter suggestion was the fact that it still maintained, though in a new form, the general principle of predisposition in broncho-pneumonia. The conditions advanced on this hypothesis were such as: (1) age less than 2 years, (2) bottle feeding, (3) under-growth, (4) poverty, (5) lack of care in upbringing, and (6) rickets.

Diagnostic Criteria.

Prof. LEONARD FINDLAY (Glasgow) said that there was no difficulty in diagnosing cases of secondary broncho-pneumonia, but primary broncho-pneumonia was quite a different proposition. In the past he had tried to decide on the clinical features, but had found that cases which during life had been diagnosed as lobar pneumonia were discovered post mortem to be broncho-pneumonia. He had therefore come to regard age as the chief diagnostic criterion, because apparently lobar pneumonia was never found post mortem in children under 3 years of age, and he had come to the conclusion that all primary cases under that age were broncho-pneumonia. In children over 3 years of age primary pneumonia was almost invariably found to be, at autopsy, lobar in type. From January, 1925, to March, 1926, all the cases dying of pneumonia in his wards had been examined pathologically. The criteria used for the diagnosis of broncho-pneumonia were those given by Dr. Macgregor—namely, bronchial infection, involvement of interstitial tissues, and comparative scarcity of fibrin in the exudate. Of a total number of 65 cases examined, 35 were examples of primary pneumonia under the age of 3 years, and of these 15 were typical broncho-pneumonia; in 14 cases the clinical characteristics and the gross appearances were those of lobar pneumonia, but histological examination proved them to be broncho-pneumonia. In five cases it was difficult to decide, but they appeared to be of the mixed type, and only one case was lobar pneumonia. He had therefore come to the opinion that the prevailing type of pneumonia in infants was nearly always broncho-pneumonia. This was of great importance, because the infiltration of the interstitial tissues meant that bronchiectasis was apt to follow, since the most important factor in the causation of bronchiectasis was fibrosis. As regards the cause of this special type of inflammation he thought that the host was a more important factor than the virus.

Lieut.-Colonel W. GLEN LISTON (Edinburgh) spoke on the bacteriology of the cases referred to by Dr. McNeil. He emphasised the difficulties of bacteriological investigation in respiratory cases, and also the similarity of the naked-eye appearances of the lungs to those seen in the influenza epidemic, and therefore he made use of a special influenza agar culture medium. Culture tubes were inoculated with material taken by lung puncture post mortem, and many of these showed a pure growth of influenza bacillus. This organism was also present in large numbers in the sputum. Out of 33 post-mortem cases the influenza bacillus was isolated in 21, and of these 21 cases all but two were broncho-pneumonia. He came to the conclusion that to isolate the influenza bacillus it was necessary to use a special medium, that the bacillus was liable to attack young people, that it could cause definite lesions in the absence of

other organisms, that it opened a path for secondary infection, and that the high death-rate of broncho-pneumonia was due to the presence of the influenza bacillus, although that organism might be isolated from cases which were not serious.

Treatment.

Dr. HUGH THURSFIELD (London) wished to deal with a different aspect of the subject from previous speakers—namely, that of treatment. He had come to the conclusion that there was no material advantage in attempting to distinguish between broncho-pneumonia and lobar pneumonia in children under 4 years of age, since nearly every child dying of broncho-pneumonia showed patches like lobar pneumonia, and it was often possible to demonstrate lobar and broncho-pneumonia in the same lung. In discussing the organism responsible for pneumonia it must be remembered that practically all the complications of primary broncho-pneumonia were due to the pneumococcus, and for the purpose of treatment it was necessary to assume that pneumonia was one disease and due to one organism. With regard to the preparation of the lung for the reception of the pneumococcus, he could not accept the view that all bacilli resembling *B. influenzæ* were, in fact, the Pfeiffer organism; in many cases they were the Bordet organism. The treatment of pneumonia had for many years remained unchanged, and, therefore, he came to the conclusion that it was advisable to try specific methods. With regard to antipneumococcal serum, it was costly, had to be given intravenously every day—a matter of great difficulty in young children—and even so it only dealt with one type of pneumonia. For the last three or four years he had used vaccines in every case of severe pneumonia. The vaccine used was a stock pneumococcal vaccine sensitised by the addition of rabbit's serum. He gave 50 millions of this vaccine on the first day, 100 millions on the second day, and 250 millions on the third day. Of 126 cases of pneumonia which had come under his care, 99 did not receive a vaccine. The average age of these unvaccinated cases was 2 years 8 months, and 28 died; 58 were under 2 years, and of these 24 died. 27 cases received vaccine treatment, their average age being 2 years, and four of the cases died. The number of vaccinated cases under 2 was 13, of whom four died; and over 2 years of age, 14, all of whom recovered. Although he did not claim that these figures established any proposition they were encouraging, and there was a slight improvement in the mortality of the two groups of cases treated with vaccine methods. It must be remembered that only the severe cases were given vaccines, and his impression of the results obtained was that the condition of those that had received vaccines 24–48 hours after the injection was better than would have been expected if they had not been treated with vaccine. One case, a very severe one complicated by empyema, was treated by immunotherapy with excellent results. In conclusion he pleaded for a further trial of specific therapy.

Dr. NORMAN CARMICHAEL (Edinburgh) said that it must be admitted that there were two definite types of broncho-pneumonia, primary and secondary. The secondary type was not difficult to diagnose, but the primary cases were. These were cases of patchy nodular broncho-pneumonia which closely simulated lobar pneumonia, and it was practically impossible to differentiate between the two conditions. In vaccine treatment it was a great help to give the vaccines early, and, therefore, an early diagnosis was important. Everyone agreed that the secondary cases were due to mixed infection; the primary cases were due to the pneumococcus complicated in a few instances by Pfeiffer's bacillus. He thought also that the pneumococcus might vary in different types of lobar pneumonia—e.g., in the pneumonias of older children, particularly of the cerebral and abdominal type. Was it not possible that the pneumococcus had different types comparable with paratyphoid organisms, and that each type had its different manifestation? He thought that advance in the knowledge of pneumonia would lie along bacteriological and serological lines.

Dr. C. P. LAPAGE (Manchester) said that most pneumonia, especially in infants, was of the favourable type, and he thought it was necessary to have further search before abandoning the view that croupous pneumonia was uncommon in childhood. Clinically it was possible to give a definite prognosis, the dry type being a favourable type. The nature of the pneumonia was determined by (*a*) predisposition, the weak and debilitated child being more liable to infection; (*b*) the chance of infection; (*c*) the route of the disease; and (*d*) the mixture of the germs, particularly the influenza bacillus. He did not use serum because the results were so good without it.

Dr. P. F. ARMAND-DELILLE (Paris) drew attention to the value of fluoroscopic examination in the diagnosis of lobar and broncho-pneumonia in small children In lobar pneumonia associated with a high temperature and a short course, possibly without physical signs, there was to be found in one lung a pyramidal shadow with its base at the pleural surface; whereas, in broncho-pneumonia with irregular temperature, the lungs were not quite as clear as normal, but there was no definite shadow such as occurred in the lobar type.

Two Incompatible Propositions.

Dr. H. C. CAMERON (London) drew attention to the dilemma in which the discussion had so far landed the meeting. Two quite incompatible propositions had been put forward. First, that it was not important to distinguish between broncho-pneumonia and lobar pneumonia, because such distinction was impossible; and secondly, that the frequency of lobar pneumonia was small but that the prognosis was invariably good. The figures produced from Edinburgh and Glasgow were quite different from each other, but surely it was true that lobar pneumonia did occur and that it was the same disease from old age to childhood, but that its virulence gradually became less. The first and most characteristic sign of lobar pneumonia was what would be expected—namely, dullness.

Dr. C. W. VINING (Leeds) said that clinically there were two clear-cut types of pneumonia, in one of which the prognosis was excellent. He thought that empyema was more liable to follow lobar than broncho-pneumonia. The value of treatment was very difficult to assess because the cases did so well. He laid importance on fresh air and continuous inhalations of oxygen, particularly in bad cases of broncho-pneumonia. He also thought that the giving of large quantities of milk was a mistake; the child should be given plenty of fluids to drink, and carbohydrates, but not milk.

Dr. WILKIE SCOTT (Nottingham) had used vaccine treatment for six years with very good results. The vaccine used was Wynn's vaccine, and the course of the disease in cases treated with it was shorter than those before vaccine treatment was used. He had also used subcutaneous administration of oxygen, but did not think it had been of any help; he only used it in bad cases.

The PRESIDENT commented on the amazing mortality of pneumonia in infancy, and pointed out that pneumonia was surely a general disease with a specific manifestation in the lung. To him broncho-pneumonia suggested symbiosis, whereas in lobar pneumonia there was a blood infection. Commenting on the value of immuno-transfusion he said he thought that this form of treatment had a very great future.

Dr. HELEN MACKAY (London) thought that some methods should be adopted to lessen the incidence of broncho-pneumonia. If the incidence of colds were diminished then the incidence of broncho-pneumonia would also be diminished. In Vienna the result of giving cod-liver oil to children during the winter months was that the incidence of colds was diminished.

She had no figures to prove this statement, but those were her impressions.

THURSDAY, JULY 21ST.

On the second day the subject of discussion was

ACUTE INTESTINAL OBSTRUCTION IN INFANCY AND CHILDHOOD.

Mr. ALEXANDER MACLENNAN (Glasgow) said that the symptomatology was much the same as in adults. The malady was a fatal one unless relieved; the prognosis in children might be somewhat less serious than in those of maturer years, but as an offset to this relative benignity must be placed the fact that in many of the obstructions due to congenital malformation relief was impossible. Children stood intestinal obstruction comparatively well, for the reason that the child's intestine was less prone to ileus than the adult's. In the main the disease was alike at all ages, but obstructions due to congenital deformities were entitled to separate consideration. In duodenal stenosis a complete stenosis was probably commoner than one which was incomplete. A feature of all developmental obstructions was the tendency for the bowel distal to the obstruction to be in a state of what might be described as embryonic spasticity. Thus a functional atresia was superimposed upon the anatomical. It was to the former condition that the well-nigh hopelessness of the prognosis must be ascribed. Fortunately, duodenal stenosis was very rare, and it was seldom diagnosed early enough for successful treatment. Indeed, it was seldom possible that any treatment could be curative, on account of the non-distensibility of the jejunum being almost always, if not always, an accompaniment. The symptoms upon which most reliance must be placed were early and persistent vomiting, with, in many cases, icterus. The operative repair of such a condition was one which would tax both the child and the surgeon. Gastro-enterostomy and duodeno-jejunostomy were operations having a high mortality in infants, and the operation was practically doomed to failure if it lasted more than 20 minutes. Other forms of obstruction due to congenital deformities were jejunal and ileal atresia, colic obstructions, rectal obstructions, exomphalos, Meckel's diverticulum, and strangulated hernia.

Mr. MacLennan said that to refer to all the various causes of acute obstruction in children would be futile, but reference might be made to one or two types which were frequently met with. It should not be forgotten that the term "acute obstruction" which referred to symptoms was not synonymous with "complete obstruction," and hence the dividing line between acute and chronic obstruction was a broad one. Acute exacerbations superimposed themselves upon the chronic, and as in children the chronic state was masked; clinically only the attacks of acute obstruction were recognisable. Under this aspect of the case came those obstructions which resulted from a tuberculous infection of the mesenteric glands with band-formation, or adhesions with kinking of the bowel from a contracting cicatrix. These conditions were often associated with a healed tuberculosis, but they might crop up during the infective stage of a plastic peritonitis. How far the final stage in any peritonitis was due to obstruction was a point which might profitably be discussed. Symptoms indistinguishable from those produced by obstruction might be set up by other conditions without any implication of the lumen of the bowel. For instance, a strangulated omentum, strangulated Richter's hernia, and a mesenteric embolism would produce a set of symptoms almost incapable of differentiation from a true obstruction. It was the general custom to classify intussusception among the obstructions, but intussusception was not more an obstruction than appendicitis was a general peritonitis. Intussusception must be operated upon before it was obstructive, as must an inflamed appendix before it gave rise to a general peritonitis. The risk of leaving an appendicitis until perforative peritonitis had developed was not nearly so serious as leaving an intussusception until obstructive symptoms set in. In intussusception, which was possibly one phase of the status lymphaticus, death was apt to be sudden and entirely unexpected.

The symptoms which resulted from the interruption of the intestinal flow, said Mr. MacLennan, were vomiting, visible peristalsis, and distension. Symptoms due to interference with function might be referred to under the following headings:—

(*a*) *Toxæmia.*—Considerable experimental work had been done to elucidate the results of the obstruction of the intestine which, although enlightening, had also added an element of complexity. The action of the chlorides, which were so quickly reduced in the circulation, had been proved to be of the greatest importance, but that their replacement was a desideratum was not yet established. Distension alone was serious from its pressure effects on the thoracic organs, its interference with deep respiration and with the heart. Clinical experience as well as scientific research showed emptying of the bowel to be essential.

(*b*) *Disturbance through the sympathetic* might explain some of the symptoms.

(*c*) *Paralysis of the Bowel.*—The changes in the circulation of the bowel and the reflex stimuli would account for the effusion of fluid which occurred almost invariably with any obstruction.

(*d*) *Peritonitis from Perforation.*—As the result of gangrene this serious catastrophe might set going its own series of symptoms, but as a rule death took place before that occurred.

Referring to treatment, Mr. MacLennan said that the stomach should be washed out early in the anæsthetic period, great care being exercised that none of the stomach contents found their way into the trachea. After opening the abdomen, distended bowel should be avoided and a gentle search for undistended gut instituted, the obstruction being approached from the sound side. After the obstruction had been relieved, if anything further were required the surgeon was often placed in a dilemma whether to resect, perform a lateral anastomosis, or to be content with an enterotomy. There did not seem to be any great reason why an enterotomy should not be done. He disliked making a fistula, but these fistulæ—in children at any rate—showed a great tendency to spontaneous closure if made through the omentum. The handling required in resecting was against its success, and so the quick methods of performing intestinal union were attractive. The possibility of adding infection to the already damaged abdominal contents was to be avoided at all costs. It was a decided advantage to leave as much saline in the abdomen as it would hold, and he thought the addition of 5 per cent. cane sugar, a half to one cubic centimetre of pituitary extract, and the same quantity of adrenalin was beneficial. The choice of an anæsthetic was most important. Most surgeons disliked chlororform for an intestinal obstruction, but where chloroform gained was in its greater power to produce muscular relaxation. An obstruction was more often associated with an alkalosis than with an acidosis; it was, therefore, possible that this general dislike of chloroform might not be an entirely sound doctrine. In this connexion the recent proposal to introduce pepsin and hydrochloric acid with saline into the peritoneum as a remedy in peritonitis might find support, and the almost invariable rule to give alkalis and glucose might sometimes require to be disregarded. The advice to give excess of sodium chloride might well receive a careful trial, not only because its quantity had been reduced, but also because it had a direct antagonistic action on the toxins developing in the distended bowel. The important item in the prognosis was the degree of ileus present, and this would depend to some extent on the amount of handling which had been found necessary at the operation, as well as upon the nature of the obstruction and the general robustness of the child. Where evisceration had been performed the prognosis was

bad. An early diagnosis, followed by prompt intervention, was still the thing which mattered most.

The Importance of Early Diagnosis.

Mr. BARRINGTON-WARD (London) said the factor of predominating importance in intestinal obstruction was an early accurate diagnosis. Nothing but surgery could avail and time was all-important. In most cases relief of intestinal obstruction in the early stages was a comparatively simple matter, in late cases the operation demanded the most expert and fortunate surgery. It was essential to be sure by an accurate reading of physical signs that intestinal obstruction was present. The cardinal symptoms were three in number: (1) abdominal pain, (2) vomiting, and (3) constipation. On examining the abdomen some voluntary rigidity would be noticed at first, and it might be possible to locate special tenderness in the region of the obstructed intestine. A little later distension was manifested and the abdomen became full and everywhere tender on palpation. There was never any true rigidity unless peritonitis supervened as a sequence to the obstruction. The surgeon's aim should be to diagnose and treat the case before any gross distension of the intestine became obvious. It was helpful to determine beforehand the nature of the obstruction. The age of the patient might assist, for at each period of life certain types of obstruction were more likely than others. If the obstruction occurred in the new-born it was likely to be due to congenital atresia or volvulus; if in infancy, to intussusception or an external hernia. In childhood obstruction by bands, Meckel's diverticulum, or the appendix vermiformis, and volvulus of the small intestine occurred most frequently. He proposed to confine his remarks to some of the rare accidents to children of later years, of which instances had recently come to his notice. He referred to three varieties of internal hernia. First, a congenital hole in the mesentery through which strangulation of the intestine might occur, a rare but interesting form of intestinal obstruction; secondly, diaphragmatic hernia, either traumatic in origin and due, as a rule, to motor-car injuries, or congenital, in which case the condition was usually recognised before obstruction occurred; thirdly, retroperitoneal hernia. The diagnosis of all these cases as obstruction was easy, but diagnosis of the kind of obstruction was well-nigh impossible. In volvulus of the small intestine there was nearly always a history of previous minor attacks; there was severe colicky pain followed by vomiting. The bowels might be regular or slightly constipated. The abdomen at first was not distended, but later when strangulation of the small intestine was complete, abdominal distension occurred. Evidence of profound ketosis was always present, the breath smelt of acetone, and acetone was found in the urine. The diagnosis was not easy but obstruction was often incomplete and recoverable, and the history of the previous minor attacks which corrected themselves unaided might put the observer off his guard. Volvulus had been wrongly diagnosed as abdominal tuberculosis, but more frequently as ketonæmia. In ketonæmia the patient suffered from severe vomiting, drowsiness, sometimes restlessness, constipation, and at times abdominal pain, and the bowels were inactive. The chief point in the differential diagnosis was the nature and character of the pain. In ketonæmia the pain followed the vomiting and was the result of the violent efforts of the abdominal muscles; in volvulus the pain was the first symptom, was always severe, and preceded the vomiting.

Nearly all the problems of treatment, said Mr. Ward, were concerned with late cases. He agreed with Mr. MacLennan that intussusception was not in its early stages a form of intestinal obstruction; there had been recently a tendency to revert to the old methods of injection or inflation as a curative procedure or as an adjuvant to operation. As to the management of the irreducible segment there was still a considerable difference of opinion. Immediate resection and union carried no doubt a high mortality but he thought it was preferable to measures that included temporary drainage of the intestine, which the child rarely survived.

Obstruction in Acute Intussusception.

Miss G. M. HERZFELD (Edinburgh) based her remarks on a series of cases of acquired intestinal obstruction seen during the past seven and a half years at the Royal Edinburgh Hospital for Sick Children. These numbered in all 160 cases, 116 being cases of acute intussusception, 16 of obstruction due to abdominal tuberculosis, 22 of irreducible and strangulated hernia, and 6 of obstruction occurring as a post-operative complication in cases of acute suppurative appendicitis. The main point of difference between acute obstruction in infancy and childhood and that of adult life was that in children the abdominal distension was often less apparent. The ladder pattern was seen typically in cases of chronic obstruction, but it should be remembered that in an emaciated child peristalsis and ladder pattern might be noted from time to time without definite obstruction. In the treatment of all cases of obstruction in infancy and childhood pre-operative care was of the utmost importance. Children stood dehydration very badly, and in every case much fluid was lost and very little absorbed. Without exception, therefore, the loss of fluid should be made good, preferably by subcutaneous glucose saline. If fæcal vomiting were present it was advisable that gastric lavage should be carried out as a preliminary to operation. The best anæsthetic was open ether, combined with local infiltration with novocaine; recently Miss Herzfeld had used spinal anæsthesia in cases of intussusception with uniformly good results. In the post-operative treatment warmth and abundance of fluid were the most important points. She wished to differ from the statement made by Mr. MacLennan that in intussusception the obstruction was definitely secondary and that its classification under obstruction might lead to delay in operation. In her experience obstruction was complete in the majority of cases within the first three or four hours and a clinical picture of obstruction was marked from the first; whereas the special features of intussusception, acute abdominal pain, and the passage of blood per rectum might not be so easily noted. It was only in rarer cases of chronic intussusception occurring in older children that the lumen of the bowel might remain more or less patent throughout the illness. In the typical intussusception of early infancy complete stoppage was the rule at a very early stage. The question of recurrence of an intussusception was of interest; she had met with seven instances. With regard to the treatment of irreducible cases she thought that everyone was now agreed that resection and anastomosis offered the best prospect of cure.

Mr. N. M. DOTT (Edinburgh) raised two points: first, that children suffering from acute intestinal obstruction tolerated operations, given a good anæsthesia, up to one hour's duration very well, and it was open to question whether the loss in delicate and accurate technique did not nullify the gain of a very short operation-time; secondly, that resection was possibly the best treatment in certain cases which, though reducible and viable, were extremely difficult to reduce and in which the bowel was severely bruised. In support of this theory he instanced a series of 20 cases of acute intussusception treated during the past two years. The results appeared sufficiently satisfactory, and from them he was led to place meticulous care in technique before the time-factor in operation for these conditions. He believed that toxic absorption from the tissue of severely bruised bowel might be a cause of death.

Dr. H. C. CAMERON spoke of the need for early diagnosis when confronted with the grave symptoms of intestinal obstruction in a new-born infant. In duodenal obstruction the diagnosis could only be made by an X ray examination in the first few days of life. There was a tendency in these cases to wrap

the child in a shawl and adopt a fatalistic inaction, but one such patient with duodenal atresia operated on by Mr. Steward made a complete recovery. With regard to acute intussusception, he called attention to the contrast in practice prevailing in Scandinavia, where in 80 per cent. of the cases taxis through the abdominal wall without laparotomy was successful. Secondary laparotomy was necessary in the remaining 20 per cent. Mr. Jennings Marshall had recently (in a small boy suffering from extreme ketonæmia with characteristic tonelessness of the abdominal muscles, who had developed after some days of illness a complicating intussusception) reduced the intussusception in a moment without difficulty. Without the ketonæmia this would have been impossible. In the differential diagnosis of intussusception from follicular colitis and Henoch's purpura he thought it was a help to note the smell of the blood-stained evacuation, odourless in intussusception, very foul-smelling in the others. Lastly, he spoke of the immense value of blood transfusion before submitting a young and ill infant to operation.

Dr. C. P. LAPAGE dealt with points in diagnosis. Intussusception should be recognised early and if possible before blood appeared in the stools or even on the finger after rectal examination. Sudden spasms of abdominal pain beginning in a previously healthy child, and recurring at increasingly frequent intervals and with increasing severity were practically diagnostic. Cases of acidosis on account of the previous attacks were not so difficult as cases of Henoch's purpura which sometimes only had a few purpuric spots on the skin of the buttock. The blood was more profuse in Henoch's purpura than in intussusception, and often the patient was very sensitive to rectal examination. He drew attention to the fact that purgatives might increase the symptoms very much in obstruction cases, and also emphasised the value of subcutaneous saline injections as an aid to withstanding the operation. In support of operation in the early days he quoted a case in which an infant of a few weeks old under his care had successfully withstood a long abdominal operation in which his colleague, Mr. John Morley, had removed a mesenteric cyst about the size of the child's own head.

Dr. MARGARET TODD (Edinburgh) said she wished to emphasise two points raised by Dr. Cameron. First as to the difficulty of distinguishing between intussusception and acute enteritis; although it seemed that this should be perfectly easy, yet her experience had been that it was not always so. It was quite possible that a history of enteritis might precede the onset of an intussusception; on the other hand, one or two greenish motions might occur after an intussusception, simulating a simple enteritis. The second point she wished to emphasise was the importance of transfusion, both as a pre-operative and post-operative measure.

FRIDAY, JULY 22ND.

On the third day, in the absence of the President, the senior Vice-President, Dr. CHARLES MCNEIL, presided over a discussion on

THERAPEUTIC MODIFICATIONS OF THE DIET IN INFANCY.

Dr. H. C. CAMERON (London) said that debates on infant feeding seldom aroused a profitable discussion, and as a rule served only to make clear the difficulty of reconciling the views of those who might be supposed to speak with authority. Therefore, in the first place he would ask the question, Wherein lay the difficulty and complexity of the subject? Why was it that on this subject, whose importance was generally admitted, opinion remained so fluid, and so little that was solid and concrete had crystallised from it? Why was it that in practice one still encountered, on the one hand, a frenzied search among a host of proprietary foods for one which would act up to the promises of all, or, on the other hand, a too rigid adhesion to some one system of feeding despite the persistence of symptoms?

It was mercifully the nature of the child to wax and grow strong, and this upon a very great diversity of dietetic prescriptions. The human infant, however, was of so sensitive a nervous organisation that a great variety of adverse circumstances were capable of ill-effects upon its health, effects which almost always manifested themselves in gastro-intestinal and nutritional disturbance. The infant had but one function highly developed—namely, the digestion and the absorption of food. So hypertrophied a function was necessarily unstable, and, in the absence of other functions capable of manifesting symptoms of derangement, disorders of very different kinds were apt to show themselves in the guise of digestive and nutritional disturbance. Because of the action of one or other of these adverse influences many dietetic prescriptions, in themselves admirable, were apt to fall into disrepute, and to bear the blame of a disturbance of which they had not been primarily the cause. On the other hand, since those influences were more often than not transitory in their action, many dietetic recipes tried at the moment of recovery bore off the credit for a recovery which was, in fact, unconnected with their use.

Such difficulties, said Dr. Cameron, were inherent in the study of the infant and its diet, but in this country at the present time there were other difficulties to be contended with which were responsible in part for the confusion which surrounded the subject. He would refer to three only, the first being a neglect of the study of pædiatrics in universities and medical schools. At these places too little attention was paid to the scientific study of the child. The subject was regarded as a specialty, and struggled painfully for recognition among the conflicting claims of oto-rhino-laryngology, orthopædics, and even proctology. It was certain that only when pædiatrics had been elevated to the rank of a subject of the first importance, and had taken its place with medicine and midwifery as one of the trilogy of the final examination, would the profession as a whole be equipped, as it should be equipped, to deal with so all-important a branch of general practice. Operative surgery, on the other hand, which to-day occupied so large a part of the student's time and attention, belonged rightly to the specialties; its practice was a matter for post-graduate rather than undergraduate study, and its technique could only be usefully acquired by the special training of some of those who had already received a medical education. The dearth of professorial chairs in pædiatrics in this country was symptomatic of, and productive of, the widespread neglect of the subject.

The Dangers of a Standardised System.

Secondly, said Dr. Cameron, there was the detrimental effect of the advertisement of proprietary foods. Digestive derangement, however caused, was taken as indicating that the particular diet adopted was responsible for the disturbance, and a change was demanded. One food after another might be tried in an unmethodical search for something which "suits." The numerous advertisements for proprietary foods were cleverly designed to play upon the anxieties of the mother. Their effect in producing this constant demand for change was not to be set aside. These foods were to some extent the raw materials of the physician's art. Their virtue lay in the uses to which they were put, not in their composition. Many owed their origin to successful prescriptions in the past for particular types of disturbance. Thirdly, there were ill-effects from misunderstanding of propaganda for infant welfare. The appreciation of the disastrous effect of these repeated and injudicious changes of diet in the dyspeptic disturbances of infancy had led some to go to the opposite extreme, and to maintain that by a rigid adhesion to some particular formula, or scheme of feeding, success could always be obtained, at least in what was called a "well" baby. Propaganda upon matters of health was by no means free from danger to the public. For popular consumption

propaganda must be so simplified that the truth was almost squeezed out of it in the process. An outline, a mere diagram, was all that could be depicted, without light or shade, without degrees of emphasis, and without consideration of exceptions or variations. Hence the successful propagandist was seldom himself an expert. If it were possible to feed all infants, healthy or sick, in the same way, the subject could have no possible interest for medical men. Indeed, under a standardised system it was not necessary before giving advice to see the infant at all. Thus in one of the largest institutions for infant welfare it was considered possible to manage the whole business by letter, and the matron conducted a consultation department known as "better babies by post." From all over the country mothers wrote describing the symptoms from which their babies suffered, and the questions and answers were published in the lay press. The child might be over-fed or under-fed, it might have pyelitis, it might be suffering from injury to its medulla oblongata at birth—no one knew. But the advice by post, a little stereotyped perhaps, simple and legible, was always to be obtained.

In the last 20 years much progress had been made in the attempt, based upon the study of the ætiology of particular symptoms, to devise modifications which might suffice to control and correct disturbances originating from a standard diet. In other words, if the sighting shot was unsuccessful one must seek to determine the nature of the error and how it could be corrected. No doubt these therapeutic diets were for the most part to be regarded only as temporary expedients, and the ultimate aim must be to restore the child as quickly as possible to the standard diet of health. Only when it had demonstrated its power to thrive on a standard diet could complete success be claimed. Dr. Cameron exhibited a series of charts showing the value of three such dietetic modifications. (1) High caloric feeding in post-infective dystrophy. In the search for a high caloric feed, he said, he had used Keller's malt soup in children over four months old and had found it most valuable, but he had obtained better results in young atrophic infants with lactic acid milk than by any other method. He had not used Karo syrup as an addition, as recommended by Marriott, but he had combined it with concentrated Benger's food. (2) Thickened feeding in vomiting of aerophagy, nervous vomiting, and hypertrophic pyloric stenosis. In these cases he gave solid food five to ten minutes before the breast or bottle was given, the result being to call forth the peristolic action of the stomach before the ordinary food was given and thus to prevent vomiting. (3) Feeding with a high percentage of casein in fermentative diarrhœa. In these cases, which might never occur in a breast-fed infant, the child had lienteric diarrhœa with green acid stools and excoriated buttocks, but the addition of casein produced an alkaline stool with constipation. He gave this in half-teaspoonful doses before or after food two to three times a day.

Dr. DINGWALL FORDYCE (Liverpool) said that the only diet which did not require modification for therapeutic purposes was breast milk. The defects of breast milk were usually those of quantity rather than quality. He did not think that chemical examination of breast milk helped very much, but bacteriological examination helped sometimes, for in three cases he had by this means discovered infection of the milk with *Bacillus coli*. In regard to artificial feeding there was not one general best dietary, nor one which might not require alteration. In most cases of digestive disorder and in the post-infective dystrophies various forms of therapeutics had been tried with good results, but he would particularly mention the results obtained by thyroid treatment, though it was not usual for the exhibition of thyroid gland to be necessary. He said that successful treatment was impossible by following a rule of thumb, and although a diathesis might or might not be recognised, yet it was most essential that the constitution of the child should be studied; he reminded his hearers that many years ago Sydenham had shown there was a tendency to particular constitutions which varied in terms of years, a fact which was also restated by Samuel West. Success in baby feeding could only be learnt by soaking in the clinical aspect either in hospital or in the home. He hoped that if Dr. Cameron's suggestion, with which he was in entire agreement, of the appointment of professors of pædiatrics were adopted, the department instituted would be for the medical care of children, and not only for the therapeusis and care of sick children. With regard to the special points raised by Dr. Cameron, he would again lay emphasis on the endocrine treatment in the post-infective dystrophies, because very important changes were produced in the thyroid by infections. He did not consider that it was necessary to give solid food in persistent vomiting; the vast majority of cases did well without resorting to this form of treatment.

Quantitative Modification of Diet.

Dr. G. B. FLEMING (Glasgow) said that Dr. Cameron's remarks on feeding had been concerned with qualitative and not with quantitative modifications. He himself wished particularly to discuss quantitative modifications, because children who were under-fed went progressively down-hill, but those who were over-fed soon rebelled. Infants were practically starved by many methods of feeding, and this he regarded as the most common cause of malnutrition. The caloric requirements per kilogramme for a normal child aged 6–9 months were as follows: basal requirements, 55 calories; to balance loss of excreta, 5–6 calories; for growth, 5 calories; and for muscular exertion, 35 calories; making a total of 100. Infantile atrophy was not a disease, but was due to malnutrition. This could occur in one of three ways: (1) the child did not receive enough food, a common cause of atrophy; (2) the food given was not utilised, this occurred in alimentary disturbances, pyloric stenosis, &c.; or (3) the food given was extravagantly used, a condition which in infancy occurred only in febrile states. The atrophic infant had no difficulty in the absorption of protein and fats, and once carbohydrates were absorbed they were well utilised. There was no alteration in the basal metabolic rate until one-third of the body-weight was lost, and after that the rate steadily fell. A simple satisfactory rule was that for every 1 per cent. a child was below 65 per cent. of its expected body-weight, it should be given 1 calorie per kg. less than the number of calories that would be required for the expected weight.

Dr. LEWIS THATCHER (Edinburgh) spoke of the value of lactic acid milk, which he used more and more as a standard diet for premature and debilitated infants, and in wasting and infective disorders. Most atrophic babies were under-fed, and this method of feeding enabled a high calorie food to be used; its value also lay in the debuffering effect of lactic acid. He began by using skimmed milk, and gradually increased the amount of fat. Another advantage of the milk was that it was possible to give with it a high percentage of carbohydrate. He showed charts illustrating the results obtained by this form of dietary in debility, parenteral infections, and pyloric stenosis. Only five feeds a day were given, and if carbohydrates were not well tolerated by the mouth 200–300 c.cm. of 6 per cent. glucose solution were given intraperitoneally. He did not know how long lactic acid milk could be continued, but if it was prepared in the way Dr. Cameron described, out-patient mothers could make the milk themselves, and in some cases he had continued its use for months.

Dr. L. G. PARSONS (Birmingham) said that he agreed with previous speakers as to the value of lactic acid milk. The milk he used was soured by bacterial means. The organism used was *Streptococcus lacticus*, and he thought the results were better than with chemically prepared milk. This method did not, however, lend itself to private practice, although it was widely used in Canada in that form of practice.

All were agreed as to the value of lactic acid milk, but it was a curious fact that fat absorption and calcium and nitrogen retention were not so good as when ordinary milk mixtures were used, and calcium retention would not compare with that obtained by giving HCl milk. György, of Heidleberg, had suggested that the good results obtained were due to the lactate-ion being synthesised in the liver to carbohydrate and glycogen. Skimming of lactic acid milk was only called for if the child had diarrhœa. As a method of feeding in pyloric stenosis its value was second only to that of breast-milk, and its acidity helped to counteract the alkalosis which developed in that condition, and which might prove a fatal complication before or after operation.

Dr. C. W. VINING agreed that under-feeding was a very common cause of infantile atrophy, and pleaded for simple methods in the modification of food. He used the caloric value as a test whether sufficient food had been given rather than as the means of framing a diet; it was necessary to have some simple method to indicate to mothers the quantity of the food required. He had had excellent results with acid milk, and also with the addition of banana pulp to milk as recommended by Dr. Thursfield.

Dr. CATHERINE CHISHOLM (Manchester) said that the ideal was to restore the child to a normal diet as soon as possible. She also used cultural methods for the production of lactic acid milk, but she thought a great endeavour ought to be made to get a breast-milk supply. With regard to banana pulp, her experience had been that for a time this gave excellent results, but after it had been given for a long period intolerance developed. She also had great difficulty in getting babies to take thick feeds.

Dr. M. F. LOWENFELD (London) said apparently there were two schools of thought about artificial feeding. One was that exemplified by Truby King, which attempted to humanise milk, and the other was the calorie school. She also drew attention to the fact that there were extraordinary variations in the quality of breast-milk. The percentage of fat depended on the amount of fluid in the breast and the degree of pressure put on the areola. Normal pressure at the beginning, with maximum pressure at the end of lactation, might produce a difference of 8 per cent. of fat, and it was for this reason that the vigorously sucking infant developed dyspepsia.

Dr. HELEN MACKAY drew attention to the fact that the dried milks varied very much in bulk, and that the ordinary domestic measure might with one form of dried milk result in the production of a milk very much more concentrated than others. She usually gave a food containing 20 calories per ounce, so as to make a small feed. If it were essential to give a more concentrated feed she gave 30–40 calories per ounce, but the child might then take more food than was necessary in order to get sufficient fluid to satisfy its thirst.

Dr. C. MCNEIL said that his experience of lactic acid milk had also been a good one, and that the tendency in milk modifications now appeared to be towards quantitative rather than qualitative modification.

ERRATUM.—The Ichthyol Company point out to us that in our notice of special drug exhibits at the recent meeting of the B.M.A. in Edinburgh a confusion has been made between ichthyol and ichtholan. Ichthyol is the raw material of various preparations, and the error consisted in placing the percentages against ichthyol instead of against ichtholan. The note should have read: "Ichthyol and ichthyol preparations including ichtholan a 10 per cent., 20 per cent., and 50 per cent. ichthyol salve with equal parts of vaseline and lanoline."

EAST HAM'S EFFORT.—In order to claim a further grant of £2000 promised by the King Edward's Hospital Fund, the sum of £15,000 must be raised during the next few months for the East Ham Memorial Hospital, the building in which is making rapid progress. There will be accommodation for 80 beds, and the cost, including furnishing, will be £75,000, which is a heavy sum for a poor locality to raise.

Reviews and Notices of Books.

A TEXT-BOOK OF MEDICINE.

By American Authors. Edited by RUSSELL L. CECIL, A.B., M.D., Assistant Professor of Clinical Medicine in Cornell University. London and Philadelphia: W. B. Saunders Company. 1927. Pp. 1500. 40*s*.

THIS large volume may claim to represent modern American views on medicine, since it is compiled by 130 contributors, of whom the majority are actively engaged in practising and teaching in the United States. It begins with an account of the common cold, and then goes on, by way of influenza, to other infectious diseases. Such a sensible start at once encourages the reader, who will not be disappointed, for this book maintains a very high level throughout its pages. If we compare it with corresponding text-books in this country, one aspect of American medicine immediately comes to light. In the section on tuberculosis, for example, almost every portion is good, but according to our ideas too little space is allotted to the physical signs of the pulmonary form of the disease. It is true that the author of this section, Dr. Lawrason Brown, attempts to disarm criticism by stating (p. 216) that "the diagnostic value of physical signs has been greatly overrated," but this does not seem to be sufficient justification for allotting one page to this means of diagnosis as compared with more than three to the examination of the sputum. It may be that the stethoscope will eventually be discarded in favour of reports from radiologist and pathologist, but this time has not arrived. Other small points call for criticism. There is no mention of urinary diastase in the section on diseases of the pancreas (p. 771). Under the heading, "new growths of lung" (p. 823), only malignant tumours are dealt with; innocent intrathoracic tumours certainly receive attention in various pages, but they would be better grouped all together. The ætiology of uræmia is incomplete, no mention being made of the vascular factor; the description of the treatment of cerebral hæmorrhage and thrombosis (p. 1305) is not very good, not sufficient emphasis being laid on the value of lumbar puncture; and, lastly, the section on birth injuries of the central nervous system is hardly fair to the section of opinion which attributes the lesions to faulty development (p. 1329).

These criticisms apart, the book is really good and certain portions are excellent, notably the section on the ætiology of rickets, by Dr. A. F. Hess (p. 553). The section on the nervous system, edited by Prof. Foster Kennedy, starts off with syphilitic affections, and is very well planned throughout. The article on pernicious anæmia is very good; to this the only English author, Dr. A. G. Maitland Jones, contributed. The index, a most important part of such a text-book, is exhaustive, covering 50 three-column pages of small print. Great care has been taken with the dove-tailing together of the various contributions into a compact whole, and the book is a worthy production of the modern American school of medicine.

DISEASES OF THE NEW-BORN.

By JAMES BURNET, D.M., F.R.C.P. Edin., Lecturer on Diseases of Children, Royal Colleges, Edinburgh. London: Humphrey Milford, Oxford University Press. 1927. Pp. 275. 6*s*.

THIS book is intended as an elementary guide to students and practitioners, which shall aid them in the recognition of such diseases and abnormalities as are met with in new-born infants and in the first month of life. Special points in the anatomy and physiology of the new-born infant are described in the first two chapters. A book on this subject must necessarily be concerned to a considerable extent with structural abnormalities and defects; these are

depicted shortly and concisely in relation to such symptoms as they may cause. An excellent chapter on cardiac defects presents the differential diagnosis of congenital heart lesions very clearly. The ætiology and treatment of pyloric stenosis are discussed somewhat fully, and stress is laid on the importance of the distinction between this condition and pylorospasm. Cerebral lesions scarcely receive the attention to which they are entitled; the value of the book would be increased if some of the recent work on spastic birth palsies were included in subsequent editions.

There is undoubtedly a need for a book of this kind; it should be useful to all who are engaged in infant welfare work, and may be specially recommended for the use of students during their midwifery course.

THE NEUROSES OF CHILDREN.

Die Neurosen des Kindesalters. By Dr. W. CIMBAL. Berlin and Vienna: Urban and Schwarzenberg. 1927. Pp. 509. M.15.

IN this book Dr. Cimbal has made an ambitious attempt to deal with all phases and degrees of nervous and mental abnormality in children. To some extent he has been justified by the result; his account is unhampered by distinctions between structure and function, the symptomatology is admirably depicted, and controversial questions, such as the relative preponderance of hereditary and environmental factors—as far as neuroses are concerned—are discussed in a balanced and open-minded manner. The influence of endocrine function on physical and mental development receives full attention, and the author's account of it contains much that is of speculative interest, though hypothesis is occasionally presented as fact. Dr. Cimbal appears to accept the James-Lange theory of the rôle of the vegetative system, which will render some of his views on the physical aspect of neuroses unacceptable to many readers in this country.

A considerable part of the book is devoted to retardation and difficulties of education. This part is certainly the least successful. The author rigidly excludes the conception of innate subnormality, and pays little attention to any element of primary amentia which may be present. The classification which results from this attitude is so lengthy as to be almost unintelligible, while little assistance is given on the important and difficult problem of the selection of cases for treatment according to prognosis and degree of educability.

DISEASES OF THE PROSTATE.

Traité des Maladies de la Prostate. By GEORGES LUYS, Ancien Interne des Hospitaux de Paris. *Prostatectomies et Tumeurs Malignes.* By VICTOR PAUCHET, Chirurgien de l'Hôpital Sainte-Michel. Paris: G. Doin et Cie. 1926. Pp. 680. Fr.90.

THIS is a large treatise on diseases of the prostate written by an author who has specialised on perurethral methods. Good accounts of the anatomy, physiology, and pathology of the prostate are given. The bulk of the work is concerned with benign enlargement. Better accounts of the problems to be faced by the urologist dealing with the disease can be found elsewhere, but the description of forage as a method of treatment is unique. M. Luys has carried out this procedure in 110 patients with almost uniformly good results. Nearly always the operation is conducted under local anæsthesia, but an essential condition is that the urethra should have been prepared by previous full dilatation with steel bougies. The actual electro-coagulation can never be completed under three or four sittings. The method is obviously a difficult one and requires much practice with intra-urethral instruments. There seems to be only one real contra-indication—namely, great size of the adenoma. The technique of removal of the prostate by suprapubic and perineal methods is well described and illustrated by Victor Pauchet, who states that he employs the perineal method in 35 per cent. of his operations and the ischiorectal approach in 5 per cent. This surgeon, who also contributes the chapter on the malignant prostate, claims 50 per cent. prolonged cures, without any trouble or fistula persisting, in ten cases of cancer.

The book is well worth reading by specialists in urinary diseases.

MANUAL OF SURGICAL ANATOMY.

Third edition. By LEWIS BEESLY, F.R.C.S. Edin., Surgeon, Craiglockhart Hospital and Hospital for Diseases of Women, Edinburgh; Examiner in Anatomy, Royal College of Surgeons, Edinburgh; and T. B. JOHNSTON, M.B., Ch.B., Professor of Anatomy, University of London, Guy's Hospital Medical School. London: Humphrey Milford. 1927. Pp. 563. 18*s*.

THE call for new editions and reprintings of this book testifies to its popularity. A comparison with the former edition reveals only a few changes, but all that was necessary to bring the book fully up to date has been done. It is easy to read, beautifully printed and illustrated, and presents anatomy to the reader from those points of view which are of special interest and help to the surgeon. It is perhaps a little long for the undergraduate student, but could not be abbreviated without losing considerably in its appeal to the operating surgeon. In its present form it fulfils the needs of both. We know of no better English treatise on surgical anatomy.

DISEASES OF THE SKIN AND SYPHILIS.

By ALBERT STRICKLER, M.D., Professor of Dermatology and Syphilology, Temple University Department of Medicine. London: Stanley Phillips. Philadelphia: F. A. Davis Co. 1927. With 218 illustrations. Pp. 689. 34*s*.

THIS comprehensive text-book is obviously the work of an experienced teacher, and contains several original features. It includes many tables to assist differential diagnosis, and every prescription for an application containing drugs for local use is substantiated by an explanatory adjective in italics, clearly explaining the exact purpose of each ingredient. This is an admirable innovation, and one which might well be adopted by the writers of future text-books in this and other branches of medicine. The basis of classification is simple, and follows ætiological facts and considerations in so far as these are established. The many original and striking illustrations from actual photographs, without which no dermatological text-book would long survive, will make a special appeal to the practitioner and to the student with an examination pending. The text is concise both in thought and in expression, and yet dogmatic assertions are avoided. The long chapter on syphilis and other diseases of the skin caused by spirochætes is well conceived and profusely illustrated. The sections on treatment fulfil all the requirements of modern dermatology. The book is not too bulky and the index is adequate. In fact, the very high standard set by dermatological text-books that have made their appearance in America in recent years has been fully maintained.

PHYSIOLOGY OF REPRODUCTION IN THE COW.

By JOHN HAMMOND, M.A., Institute of Animal Nutrition, Cambridge School of Agriculture. Cambridge: University Press. 1927. Pp. 226. 21*s*.

THIS will be found a most valuable work of reference for advanced students and research workers in veterinary and agricultural science. The text of this book was written in 1922, but the most important papers which have appeared since have received mention in the addendum. Mr. Hammond not only gives the results of his own researches, but compares

his findings with those of many other workers. The material upon which the author's work is based and the methods he relied upon are set out clearly in the introduction. The chapter on the breeding season occupies three pages, that on the œstrus cycle nearly 100 pages. Forty-six pages are devoted to pregnancy, and sterility occupies 11 pages. The sections on the anatomical and histological changes reveal an enormous amount of painstaking research.

The author states that his study was undertaken with several practical objectives in view, and mentions as one of these a basis of knowledge for the rational treatment of sterility. There is much need of further investigation into the pathology of sterility in animals. In a recent article on the Treatment of Sterility in the Cow[1] MM. Roger and Ricaud point out that sterility in the cow is still very obscure, and refer to the need for more knowledge of the physiology and pathology of the genital organs. Mr. Hammond has made no direct investigation of the causes of sterility but has certainly advanced our knowledge of the physiology of reproduction. The pathology of reproduction seems to be a matter which might well become the subject of special study by one or more of the veterinary schools and research institutes.

The book is profusely illustrated. There are 33 plates showing a large number of original photographs and microphotographs; the value of these would have been enhanced by more detailed description. The bibliography contains 400 references down to the year 1926, and provides material which may be of considerable use to advanced students of veterinary and agricultural science as well as to those whose interest is in the mammalian process of reproduction.

[1] Rev. Gén. de Méd. Vet., 1926, xxxv., 417.

JOURNALS.

QUARTERLY JOURNAL OF MEDICINE.—The July number contains the following articles: Intracranial Hæmorrhage in Infancy and Childhood, by W. P. H. Sheldon. The post-mortem records of the Hospital for Sick Children, Great Ormond-street, since 1860 show 50 cases of intracranial hæmorrhage in children under 12 years of age. The bleeding was extracerebral (meningeal) in 28, and intracerebral in 22 of these cases; none of the hæmorrhages was prenatal, but five were probably produced during labour or birth. The most notable conditions with which the hæmorrhage was associated were blood diseases, malignant endocarditis, trauma, meningitis, and pneumonia. One case was associated with whooping-cough. The article is illustrated by two plates, showing the appearance of the brain in five cases.—The Sedimentation Rate of Erythrocytes in Certain Tropical Diseases, by H. B. Newham. Observations were made in such tropical diseases as sprue, dysentery, kala-azar, malaria, ulcerating granuloma and leprosy, and in certain non-tropical conditions. In the majority of tropical diseases an increased sedimentation rate was found. The author considers that there is evidence that all cases with an increased sedimentation rate have a concomitant derangement of the liver. The sedimentation rate was not found to be related to any special blood group.—The Limitation of Muscular Effort and its Relation to Cardiac Failure, by A. E. Clark-Kennedy and Trevor Owen. These interesting observations will be dealt with later in our columns.—Observations on the Serum Calcium in Pulmonary Tuberculosis and on Treatment by Intravenous Injection of Calcium, by William Brockbank. Estimation of the blood calcium in 70 cases of pulmonary tuberculosis did not show any very considerable deviation from the normal, the tendency being for a fall in the acute cases and a rise when the disease was healed. Intravenous injection of calcium was found to raise the blood calcium temporarily for about 48 hours, and in six cases thus treated by repeated injections encouraging results were obtained.—Multiple Nodular Hyperplasia of the Liver, by L. E. Hurley and G. R. Cameron. Cayley, in 1883 first described this condition, under the name of subacute atrophy of the liver. The liver becomes small and nodular, and the disease may be mistaken for portal cirrhosis or for adenoma of the liver. The cause is unknown, but it is presumably a toxin. Two fatal cases are described, with post-mortem reports and plates illustrating the histological features of the livers. The characteristic changes in the latter are the regeneration of liver cells and the formation of new bile-ducts.—The Diagnostic Value of Dextrose-tolerance Curves, by R. Hale-White and W. W. Payne. A series of sugar-tolerance curves were made on normal and diseased people. It was found that only one type of curve is diagnostic, the diabetic type, in which the fasting blood-sugar, the height of the peak and the time of return of the blood-sugar to normal are all abnormal. In other diseases a diagnosis cannot be made on the sugar-tolerance curves alone.—Studies in Blood Coagulation and Hæmophilia. I. Blood Coagulation in Hæmorrhagic Diseases, by Ronald V. Christie. Observations on the coagulation times of successive drops of blood taken from a single puncture show that they diminish with each drop, and then remain stationary. The first drop gives the coagulation time of the blood, the second or third drops indicate the effect of the tissue reaction (liberation of a thromboplastic substance), and the subsequent drops are an index to the platelet reaction. In purpura there is a marked diminution in platelets, but the coagulation time remains unaffected. Curves of the coagulation time of successive drops of blood in purpura indicate that the platelet reaction is practically absent. It is probable that in addition to the diminution of the platelets, a toxin must also be present to produce purpura, and that in jaundice this toxic factor is usually absent, the hæmorrhagic tendency being here also due to a deficient agglutination of platelets. In hæmophilia a characteristic curve was obtained showing a deficiency also of platelet reaction.—Studies in Blood Coagulation and Hæmophilia. II. Observations on Hæmic Functions in Hæmophilia, by Ronald V. Christie, H. Whitridge Davies, and C. P. Stewart. In hæmophilia the fragility of the red cells was found to be normal, and the serum calcium, plasma non-protein nitrogen, total nitrogen, chlorides, blood cholesterol, and inorganic phosphates were all present in normal amounts. The authors consider that the coagulative defect in hæmophilia is in part due to slow liberation of prothrombin from the platelets, and a slow conversion of prothrombin into thrombin. A deficient chlorine exchange between corpuscles and plasma was also found.—Studies in Blood Coagulation and Hæmophilia. III. The Treatment of Hæmophilia, by Ronald V. Christie and G. Lovell Gulland. Hæmophilia being considered to be due to a deficiency of prothrombin, the introduction of normal prothrombin should produce a temporary amelioration of the condition, which was shown to be the case with blood transfusion. This is an effective means of stopping bleeding from a tooth socket in an hæmophiliac. The most effective local coagulant was found to be cotton-wool soaked in fresh human blood.

INDIAN JOURNAL OF MEDICAL RESEARCH. Vol. XV., No. 1.—E. Muir discusses factors which influence the incidence of leprosy, and, jointly with other workers, contributes a paper on tumour-like growths induced by intraperitoneal inoculation of rat-leprosy.—J. A. Sinton contributes three papers on the anatomy of Indian species of phlebotomus.—R. N. Chopra and others a series of three papers on pharmacological topics.—Charulrata Ray writes on the biochemistry of epidemic dropsy.—J. Cunningham on a simple method of handling squirrels for laboratory purposes, and, together with M. J. Nicholas and B. N. Lahiri, on the value of etherised vaccine for the prophylactic treatment of rabies.—H. W. Acton and J. P. Bose have investigated the susceptibility of rabbits to insulin, and the former, with L. E. Napier, describes post kala-azar dermal leishmaniasis.—Asa C. Chandler contributes further papers on the

prevalence of hookworn and other helminthic infections in India.—L. E. Napier reports upon an analysis of the results of treatment of 61 cases of kala-azar treated with the pentavalent compound of antimony —"von Heyden 693."—R. McCarrison writes upon the experimental production of stone in the bladder, and upon the experimental production of goitre.—C. A. Gill on the forecasting of malaria epidemics.

Reports and Analytical Records.

OSTELIN.

(GLAXO, 56, OSNABURGH-STREET, LONDON, N.W.1.)

Cod-liver oil is far the richest natural source of vitamin D, and is, therefore, the raw material from which such concentrates can most readily be produced. It has been known for some years that the whole of the vitamin D content of cod-liver oil resides in the unsaponifiable non-fatty fraction of the oil, and it is possible to obtain preparations which have a vitamin D activity about 2000 times as great as that of the oil itself. One such preparation, known as ostelin, which has been on the market for about two years, is available in three forms; a glycerin suspension having such concentration that 4 minims are equivalent in therapeutic value to 1 drachm of cod-liver oil; in tablet form, each tablet containing the equivalent of a drachm of the oil and 2 gr. of calcium glycerophosphate; and in combination with malt extract and orange juice, each spoonful of which contains ostelin equivalent to half a spoonful of cod-liver oil together with a like quantity of orange juice. The glycerin suspension can readily be dispensed in mixtures containing calcium salts and other medicaments. Cod-liver oil varies greatly, and it is not possible to prepare an active concentrate from an oil which is itself practically inactive. Tests are carried out in the case of ostelin by employment of the method originally proposed by Zucker, which depends upon an electrometric determination of the hydrogen-ion concentration of the fæces of standard rats. By the aid of this procedure it is possible to evaluate vitamin D content in less than one week. The number of disease conditions which are believed to be due to hypocalcæmia is very great and the phosphorus deficiency which is almost invariably associated with it is no less important. In the course of research work on the effect of ostelin on calcification in experimental rickets in rats, some analytical data were obtained as to the increase both of the calcium content and of the phosphorus of the bones.

	Controls (per cent.).	Experimental (per cent.).	Increase (per cent.).
Lime (CaO) ..	.. 10·15	19·3	90·0
Phosphorus (P_2O_5) ..	7·8	14·5	86·0

All the animals received Steenbock's basal diet (2965) and the experimental animals in addition 6/10,000 gr. of pure ostelin per diem. Such laboratory results go far to justify the claims made for ostelin in the treatment of nervous disorders, wasting diseases (especially tuberculosis), eczema, and other skin diseases, and in the infantile conditions of rickets, tetany, and spasmophilia in which it acts like a specific.

KIA-ORA PRODUCTS.

(KIA-ORA, LTD., BLACKFRIARS, LONDON.)

In our issue of July 23rd we published an analysis of Kia-Ora Lemon Squash which included a small amount of glycerol. We have since had the opportunity of analysing further samples of this preparation, and we have also made analyses of the same firm's Kia-Ora Orange Squash and also their Orange Crush, analyses of which are appended. In none of these was the presence of glycerol detected, which makes it appear very probable that the amount returned in the first analysis of the Lemon Squash was adventitious, in no way representing the ordinary composition of the extract, the more so as the makers assure us that this material is never used by them. Glycerol is, of course, perfectly harmless physiologically, so the point is not one which has any dietetic significance.

	Kia-ora Lemon Squash.	Kia-Ora Orange Squash.	Kia-Ora Orange Crush.
Specific gravity	.. 1160·24°	.. 1171·8°	.. 1253·54°
Sugar, per cent.	.. 36·9	.. 43·5	.. 65·6
Citric acid, per cent.	.. 3·07	.. 2·37	.. 2·11
Ash, per cent.	.. 0·33	.. 0·28	.. 0·25
Water and fruit pulp, per cent. ..	59·70	.. 53·85	.. 32·04

New Inventions.

A NEW PNEUMATIC SPLINT PAD.

IN the treatment of fractures of the leg the box splint in general use is efficient, but we have found it advantageous to use a new splint pad. These pads are hollow pneumatic rings, 1½ in. inside diameter, strengthened with cord and covered with stockinette, which are used in place of the "birds' nests" of wool formerly employed. The latter, often hard and irregular, frequently cause skin irritation or ulceration, particularly behind the heel. The stockinette covering prevents chafing of the skin from sweat. The ring and the skin may with advantage be powdered for extra comfort. Any device which is comfortable, efficient, and pressure-relieving should be welcomed. The new splint pad affords these advantages and maintains the heel in a constant relation to the posterior wooden surface of the splint. The pad does not alter in height after the heel is laid upon it, therefore, when the fracture is satisfactorily aligned, no change in the relation of the fragments should occur during the early weeks of union. As with the "birds' nests," several pneumatic pads are required for each case of fracture treated in the box splint.

The pads are made for us by the North British Rubber Co., Ltd., Edinburgh.

RUTH E. MILLAR, F.R.C.S. Edin.
GEORGE ROBERTSON, F.R.C.S. Edin.

INDOOR MERLIN CHAIRS FOR ONE-ARMED PATIENTS.

IT is common knowledge that the present type of Merlin indoor chair, when used by a one-armed man, is most laborious, the course being always zigzag and slow, the patient being obliged to use each side alternatively with his one arm. A special Merlin indoor chair has been designed at my suggestion to enable the patient to propel himself entirely from one side; it is fitted with two hand-rails, on the working side, in such a manner that both can be gripped with one hand. One rail is fastened direct on to the wheel, the other rail is connected through a hollow spindle to the opposite wheel. When both rails are used (being gently pressed together) the chair is propelled directly ahead. Turning movements to right or left are accomplished by moving either one or the other rail, according to the direction required. This insures steady progress in a forward direction and easy turning to right or left. This modification is in use by several patients at the Star and Garter Home, Richmond, and has proved of very great benefit. It is a simple and inexpensive device which I feel sure will add to the comfort of those who not only cannot walk but have lost the use of one arm.

Messrs. G. H. Dingwall, of 253, Queen's-road, Dalston, E. 8, have converted the ordinary Merlin indoor chair into the one here described.

EDWARD GOWLLAND, D.S.O., M.B. Lond.,
Lieut.-Colonel (T.D.), Commandant, Star and Garter Home.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 3, 1927.

THE TREATMENT OF DIABETES.

THE introduction of insulin by BANTING and BEST has meant an astonishing change in the prognosis of one of the most serious diseases of everyday life. Though the death-rate from diabetes had previously been much diminished by dietetic methods there remained many severe cases, particularly in children and young adults, in which the most careful regulation secured nothing more than postponement of an inevitable catastrophe. To vast numbers of these patients insulin has brought new hope and health; case after case has been rescued from the brink of death, the emaciated have become strong, and children have grown to adult life in safety. The remedy, indeed, appears to be a true example of replacement therapy, since clinically the artificial pancreatic extract takes the place of a deficient internal secretion. In customary therapeutic practice the recognised procedure is to work out a diet which is sufficient for the patient's energy-needs and appetite, but does not raise his blood-sugar above the normal levels or cause glycosuria. Insulin is administered if these requirements cannot be met on a diet compatible with the energy-needs. Hypodermic injections are given daily, or twice daily if need be, in sufficient dosage to prevent glycosuria on a spare but adequate diet. If insulin is needed at all it is needed every day, and although in borderline cases tolerance may improve so much that the drug is no longer required, the majority of patients must continue to take it—though sometimes in diminishing amounts—for many years and possibly for the rest of their lives. This regular hypodermic administration has certain disadvantages. Skill is required, for instance, to keep the syringes and needles clean and to measure the doses accurately, and a certain amount of patience is necessary to put up with the daily pricking of the needle. These are relatively minor objections, and, indeed, it is arguable that hypodermic medication makes for greater safety, since it encourages accuracy in the dosage of a remedy which is so potent as to be a source of danger if any carelessness is allowed. Occasionally, however, a more serious disadvantage of insulin therapy presents itself, and one that is not, perhaps, fully appreciated. Each meal increases the sugar-content of the blood, and when this rise is very large an injection of insulin must be given with the meal in order to counteract it. This counteraction, to be successful, implies an absorption of insulin into the blood at a rate closely parallel to the absorption of sugar from the intestine, and unfortunately it sometimes happens in very severe cases of diabetes that the unusually large dose of insulin is absorbed more quickly than is desirable and produces temporary hypoglycæmia, this in turn being followed by hyperglycæmia with glycosuria when, some hours later, the sugar from the meal reaches the blood in full concentration. Such cases, although rare, present great difficulties, and the need has long been felt for a drug which can be administered by mouth, and so absorbed simultaneously with the food.

Attempts to secure a form of insulin which acts after oral administration having so far proved ineffective, there has been much experiment directed towards the discovery of some other compound with similar actions. On one of these, produced by Prof. E. FRANK of Breslau, we are able to publish a preliminary report. It has been known now for some time that certain guanidine compounds will produce a fall of blood-sugar when given by mouth, but the general symptoms of poisoning which accompany the phenomenon have made such compounds useless for therapeutic purposes. Experimenting with homologues of guanidine, Prof. FRANK has prepared a substance which he calls synthalin [1] and which is a diguanidyl derivative of a long chain aliphatic hydrocarbon. Its chemical formula is for the moment unrevealed publicly. It has been on trial in many German clinics for a considerable period and has also been available to a lesser extent in other countries. In view of the fact that its exact constitution is not divulged, the remedy has not been generally issued to the profession in Great Britain, but the Medical Research Council, having received confidential communication of the formula, were able some months ago to accept supplies of the substance, and with the support of Prof. FRANK invited a number of clinicians to give it a clinical test. Accounts of their investigations will be found in the Council's report published in our present issue, and it will be seen that tests have been made under carefully controlled conditions at the majority of the London hospitals, and at Bristol, Manchester, and Edinburgh. Published reports in Germany have been somewhat confusing, certain authorities apparently stating that synthalin is a satisfactory substitute for insulin, whilst others have been cautious or even sceptical in their comment. The individual statements in the British report reveal a rather similar lack of unanimity, but careful reading of the whole allows us to reach certain definite conclusions. Some of the observers, for example, have in very restricted series of cases seen no reduction in glycosuria following the administration of synthalin, but the majority have been able to establish that the new product definitely diminishes the excretion of sugar, when it is given in sufficient quantity. The effect on the blood-sugar is more doubtful, and, indeed, it is open to question whether an effectual reduction is ever brought about by the administration of synthalin in non-toxic doses. T[illegible]umber of cases studied by each investigato[illegible]all that most of them are reluctant [illegible]ons, and for the same reason the Medical Research Council has made no attempt at this stage to correlate or summarise the findings of the different workers. Our analysis, which follows, is made with appreciation of the stress that should, or should not, be laid upon minute groups of figures. Taken as a whole it is not encouraging. It is possible to extract fairly full details of about 50 cases in which the new compound has been employed and these may be divided into two groups, the first

[1] THE LANCET, 1927, i., 35, 1168, and 1266.

consisting of 20 patients—most of them middle-aged or elderly subjects—who were treated with synthalin alone. These were all on a controlled diet, and were regarded as definitely diabetic, most of them having considerable glycosuria. In eight of them the sugar in the urine was reduced in amount; in eight others the treatment was stopped on account of toxic symptoms; in three the synthalin had no apparent effect, whilst the twentieth patient never had glycosuria at all. When it is further noted that in three of the moderately successful cases glycosuria was completely abolished by further regulation of the diet, without administration of synthalin, it becomes apparent that the results obtained with this drug have been in general disappointing. The second group comprises 32 cases in which insulin was being administered, and in which synthalin, in varying doses, was given in an endeavour to replace hypodermic by oral medication. In 11 of these it was found that the dose of insulin could be reduced when synthalin was given; in 11 others there was no effect at all; and in six the effect was very doubtful. Four cases remain; in two of them treatment with synthalin was abandoned because of toxic symptoms; in one the dose of insulin could be reduced but glycosuria was always present, whilst in one case only, among the 32, does synthalin appear to have been used successfully to replace insulin. A further word must be said concerning the toxic symptoms, which are chiefly gastro-intestinal, such as anorexia, vomiting, and diarrhœa. They occur fairly frequently but with careful regulation of dosage are seldom alarming. In one or two instances the symptoms have been suggestive of hepatitis, but in the majority they have been merely those of intestinal irritation. It must, however, be noted (as one physician emphasises in his report) that anorexia and diarrhœa will often interfere with absorption of food and thus tend to reduce glycosuria in diabetic subjects. Sodium di-hydrocholate, which has been introduced by a German firm under the name of decholin, is said to be useful for the prevention of these toxic symptoms, but unfortunately supplies of this substance were not available in this country until most of the trials under the Medical Research Council's scheme had been practically completed. At the same time there were few among the reported cases in which the symptoms were such as to call for the use of decholin.

Examination of the German literature suggests that synthalin has its greatest value in the treatment of elderly diabetics, among whom, all authorities admit, the disease is relatively mild. No remedy can take the place of insulin, really unless it has a powerful effect on the severe diabetes of children and young adults. Whereas the recorded results obtained with synthalin in this country are, on the whole, disappointing, the effects of insulin are well known to be very satisfactory, though they call for intelligence and a certain amount of self-sacrifice on the part of the patient. [illegible]id, therefore, be most unfortunate if su[illegible]betes were generally led to believe th[illegible]s them a less difficult road to health. [illegible] too strongly stated, moreover, that the successful treatment of diabetes necessitates careful dieting, and that this necessity is not obviated by using any known therapeutic substance. British patients are usually abstemious as regards their food, and the safety of the diabetic depends upon moderation. It would be a real calamity if enthusiasm for any new remedy were to cause any relaxation of the sound dietetic rules which have been so successful in recent years in the treatment of this disease.

TELEGRAPHISTS' CRAMP.

THE report of the Industrial Fatigue Research Board [1] on telegraphists' cramp, which has just been issued, indicates the modern approach to the problem of this occupational neurosis. It may at the same time throw light on the development of neuroses in general, the mention of which used until recently to call up little more than an indefinite picture of nerve cells misbehaving in some mysterious way so as to produce symptoms conforming to no known pathology. In a report published in 1911 earlier investigators made frequent use of such phrases as "nervous instability," "temperamental factors," "highly strung disposition," and the like, with no attempt to indicate how the conditions were to be detected, or in what way they could influence the onset of cramp. In the investigations now recorded, cramp subjects and a series of non-cramp controls were put through tests involving the use of the ergograph, the pursuit-meter, the McDougall-Schuster dotting machine, and the piezograph—the last-named being a telegraph key attached to an instrument recording the pressure exercised in sending messages. The results of the tests, which were carried out by Miss MAY SMITH and Mr. ERIC FARMER, showed great variability; the cramp subjects were on the whole definitely worse than the non-cramp, yet in some cramp subjects the results were better than in some controls. This anomaly was in keeping with the confusing diversity of the symptoms; some subjects, for example, suffered from a general disability to use the arm even for gross actions such as digging, whilst in others the disability affected only the sending of particular, but not all, combinations of dots and dashes. It is difficult to imagine this diversity as being in relation to any specific localisation of deranged function, but a further investigation, carried out by Dr. MILLAIS CULPIN, into the emotional state of the subjects as likely to be reflected in modes of behaviour, offers a possible explanation of some of the anomalies.

This investigation showed that 31 of the 41 cramp cases suffered from symptoms that would lead, quite apart from the cramp, to a diagnosis of a minor mental disturbance (psychoneurosis) characterised by anxiety, obsessions, or hysteria. One subject had an organic lesion, but nine had no discoverable symptoms apart from cramp, and six of these showed no disability as measured by the tests. The common picture of a cramp case is a combination of psychoneurotic symptoms with muscular inefficiency. Of 46 non-cramp subjects 15 had psychoneurotic symptoms of varying degree. The next step was an examination of 100 young learners in the school of telegraphy to find whether any were akin to the cramp group, and the rather startling result emerged that 19 showed definite psychoneurotic tendencies, six of them in such a severe form as to admit of classification in one or other of the recognised groups of psychoneurosis. The tests, particularly the dotting test, again showed a strong tendency in the psychoneurotics to fall below the average, and 11 per cent. of the whole group approximated to the common cramp picture. Lastly, other groups of clerical workers were similarly examined, and again it was found that roughly 20 per cent. had symptoms indicative of liability to breakdown, though their symptoms could not find direct expression in their work. The investigators point out that telegraphy requires from the operator certain qualities that are more temperamental than intellectual, and they believe that no allied

[1] H.M. Stationery Office. 1s. 6d.

occupation makes such exacting demands. Specific psychoneurotic tendencies are stimulated by the inevitable conditions of the work and, although not expressly stated in the report, the conclusion seems to be justified that cramp most often depends upon a pre-existing psychoneurosis which is exacerbated by the stresses peculiar to telegraphy and then manifests itself by a symptom—if the vagaries of cramp can be called a symptom—which takes as its pivot the manipulations upon which the stresses depend. It follows that young people already showing psychoneurotic symptoms or muscular inefficiency, and especially the two in combination, should not be advised to take up telegraphy, and that attention given to the emotional state of the patient when cramp first appears might offer a means of preventing its development.

In an appendix to the report Prof. M. GREENWOOD shows that a statistical comparison between the investigators' results and the judgment of the individual learner's ability, as formed by teachers in the school, indicates that the methods of investigation—both the tests and the temperamental inquiry—explore qualities related to that ability. The pursuit of the investigation outside the sphere of telegraphy has revealed an unsuspected prevalence of psychoneurotic tendencies among the general population, even among the youthful members; this work is along novel lines, and Dr. CULPIN's figures, though to some extent confirmed by their correlation with the objective tests, must largely depend upon personal judgment. In view of the part played by psychoneurotic disabilities in modern life, this part of the investigation is important enough to call for confirmation by independent observers.

THE DESCENT OF MAN.

WE are all too apt to overlook the simplest and most fundamental conceptions on which our thinking lives are based. We cannot be reminded of these too often nor can they be restated too frequently. Sir Arthur Keith's presidential address to the British Association at Leeds, which we print on another page of this issue, is of real and immediate moment to medicine and hygiene, though he tells a tale and reaches a conclusion which are familiar enough. Putting aside the difficult questions of the meaning and mechanism of evolution, he shows that all the evidence which has accumulated in the last 60 years has done nothing but strengthen Darwin's proposition that man is descended from the lower animals. It is a truth—or if anyone prefer the phrase, a working hypothesis—which we cannot drive too firmly into our minds, for there is still much to be done in working out its implications for human life. To find the remains of a branchial cleft in a man's neck is to have a pleasing contact with a noble conception. And as man's body has come from animal's flesh, so it is hardly possible to deny that all that governs and inspires his functions is correlated with the same source. We do not sufficiently reflect that Darwin's argument about the history of man's form is equally applicable to the history of his function; we get indeed more useful help from evolution in understanding what man does than in appreciating his anatomy. As a historical tool, therefore, the idea is indispensable and it may be expected to yield at least as much in the future as it has in the past. But a real belief in evolution implies more than this interest in what has gone by. If progressive change in the constitutions of animals has happened in the past, we have no reason to doubt that it is happening now and will go on happening in the future. What man will come to, no one can tell. But a belief in the Descent of Man is the first and necessary component of that lively faith in the possibilities of human amelioration without which no serious attempts at perfection can be long maintained.

Annotations.

"Ne quid nimis."

SURGERY AND THE DIAPHRAGM.

THE mechanical aspect of respiration, and particularly the physiology of the diaphragm, is still imperfectly understood in spite of much investigation, and even less can its activities be controlled. The importance of the subject may be judged by considering that post-operative basal pneumonia, massive collapse of the lung, and pulmonary embolism have all been attributed to inadequate or abnormal action of the diaphragm. Our ignorance is revealed by the conflicting theories as to the cause of massive collapse and the uncertain results that follow evulsion of the phrenic nerve—a procedure that theoretically should produce a massive collapse with some degree of precision. The question has mainly been studied in connexion with post-operative complications, and in America estimations of vital capacity have been used to gauge the effect on respiration of various types of operation. Using this method Dr. J. R. Head [1] found that operations on the upper abdomen reduce the vital capacity most of all—in some cases by 70 per cent. of the pre-operative figure. On the other hand, in chest cases a low pre-operative capacity is often surprisingly little affected even after an extensive resection of ribs. The probable explanation is that in such cases the diaphragm is in no way restricted and can to a great extent take over the work of the intercostal muscles when the ribs are constricted by a tight binder. Dr. Head is probably right in considering that after abdominal operations the reduction in vital capacity is mainly, if not entirely, due to deficient expansion at the bases of the lungs, and that his figures are in some degree an index to the extent of this deficiency. Further, upper abdominal operations are more liable than any other type to be followed by pulmonary complications, so there appears to be some connexion between such a liability and a large post-operative fall in vital capacity. He clearly realises the drawbacks of the method, for he states that vital capacity, "being a maximum gross reading, fails to indicate the state of quiet breathing and the relative aeration of different lung areas." But this is the very heart of the problem, for it is on precisely these two factors that the liability to pulmonary complications depends, so it is unlikely that this line of investigation will prove of much value. The part of the respiratory mechanism at fault must be the lower ribs and diaphragm. The former are constricted by a binder and cannot expand; the latter is inhibited. Opinions differ as to whether this inhibition is due to voluntary, reflex, or postural causes, and further research is needed on this point. The physiology of the diaphragm has been especially studied by Sir Charlton Briscoe; and the clinical observations and methods of diaphragmatic education described in his recent Lumleian lectures [2] are of great interest and importance in this connexion. Till a method is devised to keep the diaphragm active in the presence of an abdominal wound it seems that basal pneumonia, massive collapse, and possibly pulmonary embolism will continue to beset the practice of surgery.

[1] Boston Med. and Surg. Jour., July 21st.
[2] THE LANCET, 1927, i., 637, 749, and 857.

ERYTHEMA NODOSUM AND TUBERCULOSIS.

THE growing tendency to regard erythema nodosum as a manifestation of tuberculosis, to which we have alluded quite recently,[1] finds expression in a communication [2] by Prof. Rudolf Massini, of Basel. During the past ten years 29 cases of erythema nodosum have been observed there in the Bürgerspital, and an analysis of this material shows how frequent is the coincidence of the two diseases. Among the 29 patients there were three suffering from definite pulmonary tuberculosis (it broke in one of these cases three years after the appearance of the erythema nodosum), six suffering from pleurisy with effusion, one each from peritonitis, miliary tuberculosis and tuberculosis of the lymphatic glands, four from a subfebrile temperature suggestive of tuberculosis, one showed X ray signs of healed pulmonary tuberculosis, one suffered from tuberculosis of the bones, and one from Bazin's erythema induratum and Boeck's sarcoid. Altogether a formidable list of tuberculous manifestations. They were more common as sequels to, than as concomitants of, the erythema nodosum, and it was significant that these outbreaks of tuberculosis assumed most often the exudative progressive form. What was curious in the light of the opinion that erythema nodosum is simply a manifestation of tuberculosis was the unequal sex incidence in Prof. Massini's material; there were only three males to 26 females. Most of his patients were under 27, and the time of year most favoured was the spring. That the disease should show a certain seasonal incidence does not, in his opinion, necessarily invalidate the supposition that it is of a tuberculous character, for he points out that tuberculous meningitis also shows a preference for the spring. There was little in his material to correlate erythema nodosum with rheumatism, and only in three cases was there a definite history of typical, acute, rheumatic fever. He considers three possible relationships between the disease and tuberculosis: (1) It is an exanthematic rheumatic disease sui generis, the outbreak of which is favoured by tuberculosis, particularly by its acute forms. (2) It is a disease sui generis which favours the subsequent outbreak of tuberculosis. (3) It is itself a form of tuberculosis—an acute exudative form. While the exact nature of the relationship between erythema nodosum and tuberculosis still remains to be defined, enough is already known to guide our conduct in cases of this skin disease; the prospect of the development of a grave tuberculous disease in the near future is an indication for taking those prophylactic measures which our knowledge of tuberculosis has put into our hands.

PROTECTION IN RADIOLOGICAL WORK.

THE third revised report of the X Ray and Radium Protection Committee has recently been published, and it seems clear that its sphere of usefulness is being widened. Formed in 1921 under the chairmanship of Sir Humphry Rolleston, the committee has been enlarged and strengthened by the coöption of Dr. A. E. Barclay, Mr. C. Thurstan Holland, and Dr. Woodburn Morison, and its recommendations represent in very complete and practical form the considered opinion of British radiologists. The original suggestions have been very largely adopted, and it is interesting to note that where the same questions have been considered in other countries the proposals for protection are even more stringent than those originally put forward by the Committee. There is, of course, one outstanding difficulty in the application of such proposals to X ray work—namely, that they make the apparatus much more unwieldy; in some cases, indeed, it has been urged that with heavily protected apparatus it is impossible to do the same kind of work as can be done with appliances which are only slightly protected. But there is little doubt that the ingenuity of the designer will in time get over this difficulty, and allow complete freedom of use and action with apparatus bearing ample protection. An important addition to the report is a section on the precautions necessary in ultra-violet therapy. One of the most serious dangers here is the damaging effects which the rays have upon the eye, and insistence is laid upon the use of glasses of proved opacity to rays shorter than 3800 A.U. We have every reason for believing that the recommendations of this Committee on the subject of protection are gaining general acceptance by radiologists. The governing bodies of institutions where a large amount of X ray work is undertaken may in their turn feel assured that if the general lines of these reports are followed no harm is likely to be done either to patient or operator. The Committee, however, claims no infallibility, and expressly mentions at the end of the report that it will welcome suggestions or information which would lend to improve the schemes of protection which are outlined. Copies of the report may be had from the Hon. Secretaries of the Protection Committee at the British Institute of Radiology, 32, Welbeck-street, London, W., or from the Director of the National Physical Laboratory, Teddington, Middlesex.

COD-LIVER OIL AND MALT.

IN the latest annual report of the medical officer of health for Glasgow there is a section dealing with the Sale of Food and Drugs Act, and this section records an inquiry into the composition of cod-liver oil emulsions and mixtures of cod-liver oil and malt extract. In a former year a sample of malt extract and oil was found to contain only 2·82 per cent. of oil, and it was believed that this was not exceptional. In six samples of emulsion taken during 1926 the percentage of cod-liver oil varied from 23·2 to 51·05 per cent. Among the samples of extract of malt and cod-liver oil the percentage of cod-liver oil by weight varied from 2·94 to 12·51 per cent. If the malt extract is to be regarded chiefly as a vehicle, it certainly seems ludicrous that it should be necessary to consume over 30 teaspoonfuls of the mixture in order to get one teaspoonful of oil. Cod-liver oil is so much used now that the matter becomes important, and there will be general agreement with Dr. Macgregor's suggestion that the approximate percentage of oil should be declared on the label in the case of these preparations. This is only one of a number of interesting subjects dealt with in the report, a review of which appears on p. 524.

THE N.S.P.C.C.

IT commonly happens that a parent brings his child to hospital and then refuses to allow some necessary form of treatment. The refusal is sometimes comprehensible, but is nevertheless exasperating to the out-patient medical officer. The impasse appears complete, and just when it seems possible that parental obstinacy will cost the child the sight of an eye (for example), someone thinks of the National Society for the Prevention of Cruelty to Children; an urgent call for help is sent, and, as often as not, the inspector's arguments are effective. Some supporters of this Society have questioned the propriety of establishing and developing the Medical Branch, but it is becoming more and more obvious that this extension of the Society's activities is wholly consistent with its main object—"that every child in the land shall have an endurable life." The report for 1926–27 gives many indications of the useful coöperative work which the N.S.P.C.C. is doing. For instance, by means of the ambulances which the Society owns, and by arrangements made with hospital authorities, it has been found possible to overcome some of the difficulties of transporting children for treatment; as the report points out, the order "Take your child to hospital" is sometimes much easier to give than to obey. Cases are referred to the London medical branch of the Society by the London County Council, by hospitals,

[1] THE LANCET, July 30th, p. 241.
[2] Schweizerische medizinische Wochenschrift (Nr. 30).

by welfare centres, and by other bodies. In the year under review there were 611 new cases affecting 725 children, which gives some indication of the medical work entailed. Advice as to treatment is now frequently asked for by parents, and a large part of the inspector's work is to see that treatment is carried out. In the large majority of cases defective teeth and defective vision are the disabilities needing medical intervention, but the Society is also able to help those who are crippled in other ways, not only by securing admission to hospitals, but also by giving assistance in getting surgical appliances. Dr. L. D. Saunders, the medical officer of the Society, definitely states that opposition is becoming rarer, and if progress is maintained there will surely come a time when public opinion is so enlightened that no child's life will be rendered unendurable by a remediable physical defect.

CLINICAL PERIMETRY.

To the older generation of ophthalmologists the estimation of the field of vision appeared to be a comparatively simple procedure. It meant the definition of the field in ordinary daylight for white and for coloured objects in its periphery, the detection of any obvious enlargement of the blind spot, and of any absolute scotoma, whether central, paracentral, or peripheral. So much can be accomplished by the older methods and suffices for clinical purposes in many cases of advanced glaucoma, optic atrophy, partial cutting off of the vascular supply, and various well-defined cases of hemianopia. The conception of the visual field which modern perimetry suggests is not so simple. It differs from the older conception in that it is not merely qualitative but also quantitative —i.e., it takes into account not only the fact that there is or is not any visual acuity at all in any particular spot of the field, but also the degree of the acuity at that particular spot. It is this quantitative conception of the field with which Dr. Traquair has recently been concerned.[1] He compares it to an island of vision surrounded by a sea of blindness.

> "The coast-line is somewhat ovoid in shape, and rises steeply, so that the island is surrounded by cliffs, vertical on one side, sharply sloping on the other. Above the cliffs is a sloping plateau which rises more rapidly again towards the somewhat eccentrically situated summit. This is crowned by a sharp pinnacle whose sides curve steeply upwards from a narrow base. To one side of this point is a pit (the blind spot) with sides almost vertical at first, but soon becoming perpendicular, which extends down to the level of the surrounding sea . . . If we choose to exercise our imagination still further, and picture to ourselves this hill under abnormal conditions, we must think of it as distorted or partially destroyed by subsidence. Depressions of every variety may occur on its surface, of all shapes, sizes, and depths, with straight, curved, or irregular margins, with sloping or steep sides, isolated or extending to the shore or to the pit, or partly or wholly involving the central pinnacle."

We make no apology for the length of the foregoing quotation, for it illuminates a subject which is of growing importance to both the ophthalmic surgeon and the neurologist, who will look in vain for such a light on it in even the most up-to-date of the general ophthalmological text-books. Bjerrum's screen, it is true, is always mentioned in connexion with the detection of central scotomata. But the special function of this or any other form of scotometer for detecting relative defects in the field by means of using small test objects at distances greater than 33 cm. (that of the ordinary perimeter), is seldom explained, and nowhere so well as in this book. The chapters in Part I. deal with the normal field of vision, perimetric instruments, methods of examination, and the physiology of the visual field in relation to clinical perimetry. Part II. is entitled Applied Perimetry, and deals with the pathological field, and the interpretation of changes in the visual fields; also with the relation of these changes to affections of the choroid and retina, to glaucoma, to affections of the optic nerve, to the chiasma and the suprachiasmal pathway, and finally to functional conditions such as hysteria. Figures as to the exact limits of the normal field, according to different observers, are relegated to an appendix, and a bibliography gives references to over 300 papers published in European and American journals dealing with various aspects of the subject. The diagrams are an essential aid to the reader, and the print is luxurious. The work should prove invaluable alike to the ophthalmic surgeon and to the neurologist.

[1] An Introduction to Clinical Perimetry, by H. M. Traquair, M.D., F.R.C.S. Edin., Assistant Ophthalmic Surgeon, Royal Infirmary, Edinburgh. With 164 illustrations and a coloured plate. London: Henry Kimpton. 1927. Pp. 264. 30s.

DANTE AND RABELAIS.

AT the recent Edinburgh meeting of the Royal Medico-Psychological Association Dr. Hamilton Marr gave an interesting presidential address entitled Dante and Rabelais: An account of two Mediæval Physicians, with a Summary of their Philosophy. Rabelais undoubtedly was a qualified physician and practised his profession in the city of Lyons, but as Dr. Marr pointed out, it is news to most of us that Dante was a medical man. He certainly enrolled himself in 1295 or 1296, in the Guild of Physicians and Apothecaries, but that was in order to qualify for participation in the government of Florence, and it is probable that he knew no more medicine than a member of the Mercers or the Cutlers Company to-day knows of mercery or cutlery; in the roll of the Guild of Physicians and Apothecaries Dante is described as *poeta*, although as a universal scholar Dante shows a knowledge of medical matters in his works. Dante's works, especially the "Divina Commedia," are a summary of mediæval philosophy and theology, expressed in exquisite language and full of the love of nature. Just as in the Iliad fire is the dominating element, so in the "Divina Commedia" light is. Rabelais, who lived some 300 years later than Dante, was a man of a very different type; but if we eliminate his coarseness, which is in no way necessary to his philosophy, what a treasury of satire and sound good sense remains. Born in different ages, varying in their outlook on life, both Dante and Rabelais set forth three great principles: to live in this world as a preparation for the next, to love one's neighbour as one's self, and to reverence knowledge. The work of to-day is so arduous, and so much modern knowledge has to be acquired, that medical men owe a debt of gratitude to Dr. Marr for having so pleasantly set forth the advice of two old-time scholars. His address will no doubt appear in a forthcoming issue of the *Journal of Mental Science*.

OPIUM-EATING IN INDIA.

THE extent to which any particular form of drug addiction is undermining the health and efficiency of a nation is difficult to estimate, especially when the drug in question has wide medicinal value. Statistical figures of consumption, although they may show the general trend towards increase or decrease, do not reveal details and are notoriously fallible. In India, for instance, where opium has been used as a household remedy for generations, there is great difference of opinion about the extent of its abuse, and this has led Dr. R. N. Chopra and Dr. K. S. Grewal[1] to begin a detailed study of the opium habit in the Sikh community in Calcutta, amongst whom it is prevalent. The majority of these Sikhs are engaged as taxi-drivers, watchmen, or artisans. They take their opium by the mouth, as is usual in India, where opium smoking is rare. One hundred cases were examined in detail, and analysis of these showed that by far the commonest cause of opium taking (58 cases) was the association with and example of addicts. Pain and disease was the next cause (30 cases), but in only four of these was the drug first used on the advice of a physician. Of the occupations considered, taxi-drivers head the

[1] Indian Journal of Medical Research, July, 1927.

list, probably because they are comparatively well off, and have plenty of time for rest and social intercourse between fares. In 81 cases the habit was acquired below the age of 35, and, once started, it tended to continue for many years. Sixty-five of the addicts declared that opium-eating did them harm; they wished to give it up but were afraid to do so because of the symptoms which develop on withdrawal of the drug. Heredity did not appear to be an important predisposing cause. In this series of 100 addicts, 34 took from 10 to 20 gr. of opium a day, 25 per cent. took more than 20 gr. a day, and a number of the latter took over 50 gr. The larger doses were taken by the younger men. Individual study showed that the habit decreases working capacity, whilst the rapid onset of withdrawal symptoms quickly causes slavery to the drug. It is worth noting that all the addicts examined were at work. This probably means that the later and more disastrous consequences of the habit are masked, for these would be found among men who were no longer fit for employment.

THE ANOPHELINE MOSQUITO.

IT is now nearly 30 years since Ross in India first demonstrated the presence of the parasites of human malaria in the gut of "dapple-winged" mosquitoes. Since then a large amount of research has been carried out in various parts of the world regarding the part played by anophelines in the dissemination of the disease. At first it was thought that all anopheline mosquitoes were equally concerned in the transmission of malaria, but research by Stephens, Christophers, James, and others effectually demonstrated that certain species were far more efficient malaria-carriers than others. In considering the part played by different species, it has to be remembered that many factors may affect the results of observation. Amongst these may be mentioned the time of the year at which the investigation is carried out, and whether or not malaria is rife at the time. As is pointed out by Swellengrebel, Schüffner, and de Graaf, several questions must be answered in assessing the capabilities of any particular species. Does the species occur in great numbers? Is it capable of allowing the parasites of malaria to complete their development? Does it habitually feed on human blood, not only in captivity, but also in nature? Does it feed in the jungle, or does it regularly visit man in or near his dwelling-places? In an Indian medical research memoir [1] of 117 pages Major G. Covell, of the Central Malaria Research Bureau, Kasauli, has now summarised all the available information on these subjects, arranging the known species of anopheles in alphabetical order. He has considered the distribution, breeding-places, habits, relation to malaria, and experimental infections of anophelines, and in so doing has conferred a very considerable boon on his fellow-workers not only in India but throughout the tropical world. The report includes a very complete bibliography as well as an index.

TYPES OF STREPTOCOCCI IN SCARLET FEVER.

Dr. F. Griffith, of the Ministry of Health, has found that hæmolytic streptococci isolated from cases of scarlet fever fall into three main serological groups (Types 1, 2, 3), while a large heterogeneous group of organisms—roughly 50 per cent. of the whole—which seem to possess individual antigenic properties are designated Type 4. Of these groups Type 2 is the most sharply defined, and is found only in association with scarlet fever, while Types 1 and 3 show relationship with hæmolytic streptococci from non-scarlatinal sources, such as puerperal fever and sore-throat. Similar results have also been obtained by G. R. James and J. Smith, and an attempt has now been made by Dr. William Gunn [1] to correlate the type of streptococcus found in scarlet fever with the clinical findings. One hundred patients with scarlet fever were investigated, and streptococci were isolated from 93 of them. In two cases the organisms were of Type 1, in 34 cases of Type 2, and in 17 cases of Type 3, whilst in the remaining 40 they were either of Type 4 or unclassified. The proportion of types was not dependent on any age-groups. No definite conclusions could be drawn about streptococci of Type 1 as only two cases occurred in the series; Type 2 was associated with the most typical and severe forms of the disease; Type 3 with those which were less severe; and Type 4 appeared to cause only a mild attack. The complications were most severe when Type 2 organisms were found, and were less numerous and severe in Types 3 and 4. Infection by the unclassified strains clinically resembled infection by Type 3. There were four instances of scarlet fever occurring in two members of the same family, and in each case the type of streptococcus isolated from different members of the family was the same (Type 2 three times and Type 3 once). The differences in type of the scarlatinal streptococci may explain the different results obtained with the same batch of scarlatinal antiserum in cases apparently similar from a clinical standpoint, and may also explain why some cases give anomalous results to the Dick and Schultz-Charlton tests. It will be necessary to consider the risk that a patient with mild Type 4 infection may be attacked whilst in hospital by a virulent Type 2 streptococcus; it has often been observed that when hospital beds are close together the proportion of cases developing scarlatinal complications may become larger. Though the importance of recognising the various types of scarlatinal streptococci has not been fully determined, it is obvious that ætiology of scarlet fever is not quite as simple as was thought at first.

WE offer our congratulations to Mr. Priestley Smith on receiving the Lucian Howe medal of the American Ophthalmological Society. This medal has been awarded only three times previously, the recipients being Dr. Kohle, of Vienna, who first used cocaine in ophthalmic surgery; Prof. Fuchs, of Vienna; and Dr. Edward Jackson, editor of the *American Journal of Ophthalmology*. Mr. Priestley Smith was personally visited, on behalf of the Society, by Dr. W. H. Wilder, who took the opportunity of seeing the apparatus which Mr. Smith is using in his investigation of the circulation of the eye.

WE are asked to remind readers that the next session of the *Journées Médicales*, organised by a committee of the *Revue Pratique des Maladies des Pays Chauds*, will take place from Dec. 15th to 24th, 1927, in Cairo. All communications should be addressed to M. Zeitoun, Secrétaire-Général, 32, Rue Gay-Lussac, Paris (V.). The organisation has received the support of numerous influential Egyptians both as patrons and as active collaborators. The Committee have under consideration the proposition recently made by the Egyptian Government to make a session of the *Journées Médicales* coincide with the centenary of the Kasr-el-Aini Hospital in December, 1928, and we learn that there is every intention to establish a close relationship between the two movements.

[1] Memoir No. 7 (Supplementary Series to the Indian Journal of Medical Research). A critical review of the data recorded regarding the transmission of malaria by the different species of anopheles; with notes on distribution, habits, and breeding-places. By Major G. Covell, M.D., I.M.S. Published for the Indian Research Fund Association by Thacker, Spink, and Co., Calcutta.

[1] Metropolitan Asylums Board Annual Report, 1926–27.

LEGACY TO THE PASTEUR INSTITUTE.—The death has occurred at his villa at San Remo of Dr. Réné Marius Appert, of Paris, aged 65, who has bequeathed the residue of his estate to the Pasteur Institute, Paris. The value of the legacy is expected to approximate to £160,000.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCXXXIX.

THE TREATMENT OF G.P.I. (PARESIS; DEMENTIA PARALYTICA).

I. The Recent Case.[1]

PARESIS has for long been regarded as a hopeless condition in which treatment was of no avail. This is not now an accurate view. Life can be prolonged and remissions encouraged by prompt treatment and proper care.

Early Diagnosis.

Early cases offer the most favourable prognosis. Character changes in early middle life, or later, should provoke a minute search for the well-known physical signs of general paralysis on the part of the practitioner. If there is any doubt specimens of the blood and cerebro-spinal fluid should be obtained forthwith, so that any uncertainty can be quickly resolved. The refinement and accuracy of modern methods of diagnosis should ensure the recognition of paresis at a very early stage. Advanced cases may improve under treatment, but psychical defect nearly always remains.

Malaria Therapy.

The malarial treatment offers new hope in the treatment of paresis. It is the natural result of the almost despairing use of substances which have had some unknown stimulating effect on tissue resistance, indicated by a sharp leucocytosis and accompanied by pyrexia. Injections of such substances as nucleinic acid, sodium nucleinate, phlogetan, and lecithin have been followed by improvements. Sera have also been used, and vaccines prepared from a variety of organisms have been tried.

The treatment of paresis by inducing an attack of benign tertian malaria gives results which hitherto have never been attained. Not every case of paresis is fit for treatment by malaria, and several considerations must be weighed carefully before it is decided upon, but the method can be advised for every suitable case. An important factor is the age of the patient. The older he is the less satisfactory the result, and the greater the risk of a fatal issue. For a patient older than 45 the treatment entails increasing risks, and results may be poor. The response seems to be best in the classical elated or manic patient. The depressed paretic, the tabo-paretic, and the slowly dementing forms of the disease give less satisfactory results, though exceptions do occur. Renal disease, the presence of jaundice, cardiovascular disease, and marked anæmia increase the risk of malarial therapy and may even contra-indicate its use. A careful examination and frank discussion with the family should precede treatment when patients are suffering from conditions which will add to the dangers of the pyrexial period.

Technique.

The treatment consists in infecting the patient with benign tertian malaria, and allowing the malaria to continue unchecked until 10 to 14 rigors have occurred, when the fever is controlled by the administration of quinine. The best means of producing infection is to take 3 c.cm. of blood from a patient already under treatment, preferably during a febrile attack, and injecting it subcutaneously in the subscapular region of the recipient. After an interval, which varies from 6 to 21 days, the rigors commence and should be allowed to continue as long as the patient can safely tolerate them. Another method is the use of suitable infected mosquitoes, which are procurable with the generous assistance of the Ministry of Health. The mosquitoes are brought to the patient in glass containers which are applied to the skin, and are allowed to bite freely. In my opinion, the malaria produced by mosquito bite is less easy to control by quinine than that produced by infected blood, and relapses of the fever more frequent. During the pyrexia confusion, delirium, and hallucinations are common, and wild excitement may occur. On the whole the patients are fairly tractable. The treatment will necessarily confine the patient to bed, though he may be allowed up between the first two or three rigors. The pyrexia varies, but temperatures of 104° to 106° F. are common. The fever may be tertian, with rigors on alternate days, but is often double tertian, the paroxysms taking place daily.

Regular examinations of the urine should be made. Albumin is sure to appear, but need not cause alarm unless it becomes large in amount. Pronounced albuminuria, the appearance of jaundice or marked collapse are indications for arresting the course of the malaria, but it must be remembered that the best results follow 10 to 14 rigors. No treatment must be allowed during the rigors save sponging when the temperature rises to 105° or more.

The administration of quinine by the mouth arrests the malaria in a most effective manner. Quinine sulphate, or hydrochloride, gr. x. t.d.s. for three days, produces a rapid subsidence of the fever, and the parasites disappear from the blood. The quinine is even more effective if given intramuscularly, and when there is an urgent need to control the pyrexia it may be given intravenously. The patient will have lost weight, may be weak and anæmic, but as convalescence becomes established the mental condition should improve, and may continue to improve for three or four months after the cessation of the treatment. During this period novarsenobillon or sulfarsenol should be administered intravenously. It is well not to begin with too large a dose, and to increase the doses gradually. The malarial treatment may be carried out at home, in a nursing home, or hospital. The room of the patient is best rendered mosquito-proof by framing the windows and door with fine net. A frame may be made also for the bed, which can with advantage be protected.

The patient should be instructed to return for a course of treatment by arsenical compounds every six months during the remission of his symptoms. Lumbar puncture is useful in giving laboratory information as to the result of the treatment. The Wassermann reaction remains positive, but there should be a pronounced fall in the lymphocyte count and a diminution in the globulin content.

Other Methods.

Trial is being made of a method for inserting salvarsanised serum into close contact with the surface of the brain by performing cisternal puncture. When convalescence after the malaria is established a dose of N.A.B. is given, and after 30 minutes some ounces of blood are withdrawn, from which the serum is extracted. The following day, under a general anæsthetic, a needle is inserted into the cisterna magna, and the serum introduced, first withdrawing a similar quantity of cerebro-spinal fluid. Six injections are given at weekly intervals and very marked improvement has been recorded. Tryparsamide, a sodium salt of N-phenylglycineamide-p-arsonic acid, is also being used for the treatment of paresis. It is one of the substances which apparently passes the choroid plexus, and though there are definite risks associated with its use, it may be advised where other methods have failed. It is best given intravenously in doses of from 1 to 3 g. dissolved in 10 c.cm. of sterile distilled water. Not less than eight days should intervene between the injections, and eight injections complete the average course. Ocular disturbances are the chief risk. They may be temporary, but complete and permanent blindness has resulted in some cases from the use of tryparsamide.

[1] An article by Dr. James on the Treatment of General Paralysis: II. The ChronicCase, will appear in this series next week.

The remedy is still in the stage of trial, and patients must be carefully selected.

Social and Medico-Legal Considerations.

The paretic is a difficult patient, especially in the early stages of the disease. He is often a danger to himself, his family, his fellows, and his fortune. Judgment is so defective that delusions flourish. The practitioner should warn the friends of the probability of disordered conduct, even where no signs of it have yet appeared. In addition to the excesses and extravagances of the elated patient, the depressed paretic may commit suicide, and the suspicious type may assault the innocent victim of his suspicions. Insight is quickly lost in the early paretic, and it is hopeless to argue with him. His promise to behave is quite valueless, and in his own interests certification should not be delayed too long.

Some of the slowly dementing patients and the tabo-paretics can be managed at home. Caution must be exercised in telling the relatives and friends the nature of the disease. In any case it is inadvisable to give a diagnosis until it is firmly established by careful laboratory examinations of the blood and cerebro-spinal fluid. No delay to vene-puncture and lumbar puncture should be sanctioned by the physician. In suitable cases energetic treatment should be urged, and in view of the impressive results of modern treatment a hopeless prognosis should not be given.

Not infrequently the wife of a paretic is fully aware of the nature of the disease and its course. She fears for herself and her children. Happily, the practitioner may safely reassure her. There is no danger to be feared from close contact with the patient, and no reason even to forbid sexual intercourse. The unfortunate patient has often been passed as medically fit for marriage, and unless there were active specific signs at marriage, and a history of miscarriages, the wife and children will invariably be found to be healthy. If the wife continues to be apprehensive, a family blood Wassermann may be taken, and a negative result is the rule.

If treatment is successful, the future life of a general paralytic should be carefully regulated. The diet should be simple, he should take gentle exercise in the open air, and the bowels must be kept active. He can, and often does, carry on his work after treatment and may continue to support himself and his family.

Careful notes of the mental condition should be made from time to time, and kept. Questions of business and testamentary capacity frequently arise, when some record of the mental state is useful, and it is often lacking when most wanted.

Lastly, the laboratory reports on the blood and cerebro-spinal fluid should always be filed, and refusal of treatment, a not infrequent occurrence, should be noted in the records made concerning the patient.

G. W. B. JAMES, *M.C.*, M.D. Lond.,
Physician for Mental Diseases to St. Mary's Hospital, Paddington.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt. A. B. Grant to be Surg. Lt. Comdr.

Surg. Lts. (D.): H. A. Ginn to *Pembroke*, for R.N. Barracks; H. E. Rose and L. V. Donegan to *Victory*, for R.N. Barracks; H. V. Pell to *Ganges*; H. M. Hill to *St. Vincent*: J. M. Park to *Effingham* 11, for station duties; R. J. M. Andrews to Sandhurst; and T. Hunt to Egmont, temp. supy. (undated).

ROYAL NAVAL VOLUNTEER RESERVE.

Prob. Surg. Lt. A. W. Kendall to be Surg. Lt.

Surg. Lts.: H. Parry-Price, promoted to Surg. Lt. Comdr.; and R. B. Dodd to *Victory*, for R.N. Hospl., Haslar, for 14 days' training.

Surg. Sub-Lts.: D. R. W. Burbury, promoted to Surg. Lt.; and D. S. Buchanan to *Emperor of India*, for 14 days' training.

Surg. Lt. (D.) G. P. Monk promoted to Surg. Lt. Comdr. (D.).

Prob. Surg. Lts.: F. A. McLaughlin to *Furious*, for 14 days' training; and W. McO. Macgregor to *Renown*, for 28 days' training.

ROYAL ARMY MEDICAL CORPS.

Maj. R. G. S. Gregg retires on retd. pay and is granted the rank of Lt.-Col.

Maj. S. C. Bowle to be Lt.-Col., vice Lt.-Col. J. H. R. Winder, D.S.O., to retd. pay.

Capts. to be Majs.: O. D. Jarvis (Prov.), T. H. Sarsfield, and H. T. Findlay.

Capt. A. C. Murray to be Temp. Capt. and temporarily relinquishes the rank of Capt.

Temp. Capt. J. A. Quin relinquishes his commn. and is granted the rank of Capt.

Lt. (on prob.) E. W. Hayward, from the secd. list, is restd. to the estabt.

Temp. Maj. J. L. Dimond relinquishes his commn. on account of ill-health and retains the rank of Maj.

ARMY DENTAL CORPS.

Temp. Lt. J. J. Seaton, Dental Surg., Gen. List, to be Lt.

ARMY RESERVE OF OFFICERS.

The following, having attained the age limit of liability to recall, cease to belong to the Res. of Off.: Col. P. McKessack, late R.A.M.C., and Lt.-Cols. R. L. Argles, H. L. W. Norrington, and J. H. R. Winder.

TERRITORIAL ARMY.

Lt. J. A. Fretton to be Capt.

Lt. J. Ledingham resigns his commn.

Lt. J. O'Hara, from the 52nd (Lowland) Divl. Train, R.A.S.C., to be Lt.

Supernumerary for service with O.T.C.—Capt. V. C. Pennell, late R.A.M.C., to be Lt. for serv. with Med. Unit, Cambridge Univ. Contgt., Sen. Div., O.T.C., and relinquishes the rank of Capt.

Capts. W. Johnson and E. T. Burke to be Majs.

Capt. J. McG. Johnson resigns his commn. and to retain his rank.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt.-Cols. F. E. Fremantle and M. A. Cooke, having attained the age limit, are retd. and retain their rank, with permission to wear the prescribed uniform.

Capt. W. J. Wilkinson, having attained the age limit, relinquishes his commn. and retains his rank.

Hygiene Companies.—Capt. H. G. Moss resigns his commn. and retains his rank.

ROYAL AIR FORCE.

The undermentioned are granted permanent commissions in the ranks stated: Flight Lt. R. W. White and Flying Officer C. J. S. O'Malley.

The undermentioned Flying Officers are promoted to the rank of Flight Lt.: J. McM. Wilder and F. B. C. L. B. Crawford.

Flight Lt. F. T. Allen relinquishes his temporary commn. on account of ill-health.

Flying Officers: J. E. Foran to Headquarters, Egypt; and J. McCarren to Research Laboratory and Medical Officers' School of Instruction, on appointment to a Short Service Commission.

Flying Officers (D.): H. J. Eagleson to Station Headquarters, Andover; and A. P. McClare and S. McC. Craig to R.A.F. Depôt, Uxbridge, on appointment to temp. commns.

Flight Lt. D. Loughlin to School of Technical Training (Men), Manston.

ARMY MEDICAL SERVICE (R.A.M.C.): ERRATUM.—In the Students' Number of THE LANCET, published last week, the section of the Royal Army Medical Corps dealing with *Retirement and Retired Pay* and containing paragraphs numbered 1, 2, and 3 (p. 466) was inadvertently placed in the section on conditions in the Army Dental Corps. We regret the printers' error, while knowing that it will be detected immediately.

Special Articles.

SYNTHALIN IN THE TREATMENT OF DIABETES.

PRELIMINARY REPORTS TO THE MEDICAL RESEARCH COUNCIL.

THE substance known as "synthalin," which has been on trial as a substitute for insulin in Germany, and to some extent in other countries, during the past year, had its origin in the experimental investigations of Frank, Nothmann, and Wagner.[1] Starting from the fact that administration of guanidine is followed by a certain fall of blood-sugar, accompanied, indeed, by general symptoms of poisoning, these authors investigated a series of guanidine derivatives, in the hope of finding one which had an enhanced effect on the blood-sugar and a diminished general toxicity. From "agmatine" (guanidylbutylamine, obtainable by decarboxylation of arginine) they proceeded to higher homologues. The name "synthalin" was given to the compound of this series exhibiting the most favourable relation between efficiency in lowering the blood-sugar and general toxic action. The formula, which Prof. Frank communicated to the Medical Research Council before the commencement of the investigations here recorded, and which he is now about to publish, shows it to be a diguanidyl derivative of a long-chain aliphatic hydrocarbon.

Synthalin, being a pure, stable compound readily soluble in water, is absorbed without difficulty when taken by the mouth, and exhibits its characteristic activity under these conditions. If its action were truly insulin-like, and not attended by other drawbacks, this possibility of oral administration would obviously give it great advantage over insulin. The reports published from other countries are not uniform in their conclusions. The majority of the observers who have published their experience appear to have obtained results which have led them to attribute value to "synthalin" as a partial or, in mild cases of diabetes, even as a complete substitute for insulin. There are others whose experience has not been so favourable. There is some evidence, even in the records of treatment of human cases, of a toxic action on the liver, leading to the obvious warning against the employment of "synthalin" in diabetes complicated by cirrhosis. Many of the apparently favourable records are based on a disappearance of sugar from the urine rather than a lowering of the blood-sugar; and some cases have been treated as out-patients without effective control of the dietary intake. Under these conditions it was represented to the Medical Research Council that it would be desirable to have "synthalin" tested in this country on a series of cases under controlled conditions before it was offered to the medical profession generally. This suggestion had the support of Prof. Frank and of the manufacturers, who placed a suitable supply of the preparation at the Council's disposal for the purposes of such a preliminary trial. For this the Council invited the coöperation of a number of clinicians at different centres, to whom fractions of the available supply were distributed for the purposes of clinical tests.

Printed below are the separate reports which have been received from those taking part in the scheme of trials. The numbers of cases treated and the periods covered are as yet insufficient for any final conclusions to be drawn. The reports are accordingly to be regarded only as preliminary accounts. For the same reason, no attempt to correlate or summarise the findings of the different workers has been made at this stage.

One of the main difficulties encountered in the treatment of cases with "synthalin," by those responsible for its introduction, as well as other observers in different countries, has been the liability of the substance to produce anorexia, nausea, and consequent symptoms of depression. This trouble does not occur in every case, but is liable to impose a limit both on the daily dose of "synthalin" which can be administered and on the period for which its administration can be continued without intermission. Various efforts have been made to find other substances, the concurrent administration of which would mitigate this defect. According to the published accounts,[2] the most successful of these hitherto found appears to be sodium dehydrocholate, which has been introduced under the name "decholin." The stimulation of bile secretion by this bile-salt derivative is believed to have an antagonistic effect on the toxic action of "synthalin" on the liver, and the practical results of the combined treatment are said to be favourable. Unfortunately, supplies of "decholin" were not available in this country until most of the trials made under the Council's scheme had been practically completed. At the same time, it may be noted that there were few among the reported cases in which symptoms were produced by the "synthalin" treatment calling for the use of "decholin" as well.

While these clinical trials have been in progress experimental observations on the action of "synthalin" on normal animals have been in progress in the Biochemical Department of the National Institute for Medical Research. The full results of these will later be published elsewhere. In the present connexion it may be noted that the experiments have shown that in the normal animal "synthalin" has to be administered in doses producing a definitely toxic action on the liver, in order to produce a decided fall of the blood-sugar. Such results taken by themselves give the impression that its effect is mainly due to a depression of the new formation of sugar in that organ. Other experiments, however, carried out on the eviscerated, spinal preparation have produced evidence that "synthalin" also accelerates the disappearance from the circulation of glucose already present as such, though the glucose thus disappearing is not, as in the case of the insulin action, laid down in the tissues as glycogen, and large, toxic doses of "synthalin" are needed for demonstration of the effect.

Broadly speaking, the two sides of the insulin action—the depression of new formation of glucose in the liver and the accelerated metabolism of glucose already present in the circulation—appear to be represented in the action of "synthalin." The question of its practical use will obviously be decided by the degree to which its beneficial action is complicated by its toxic effects. It is clear that an ideal insulin substitute has not yet been obtained. "Synthalin," however, may be regarded, perhaps, as a partial success, giving at least a hope of further progress in the same direction.

REPORT FROM ST. BARTHOLOMEW'S HOSPITAL, LONDON, BY GEORGE GRAHAM, M.D., F.R.C.P., AND G. C. LINDER, M.D., M.R.C.P.

Synthalin has been used according to the method recommended by Frank, with some minor alterations, in order to test its action in comparison with insulin. Nine patients have been treated, seven of whom had been having insulin for some time. No patient has been treated for more than eight weeks, and these remarks cannot be regarded as anything but preliminary observations.

Cases not Receiving Insulin Treatment.

CASE 1.—A boy of 14 years, with mild diabetes for one year. On 80 g. carbohydrate he passed 20 g. sugar in the

[1] Frank, E., Nothmann, M., and Wagner, A.: Klin. Woch., 1926, No. 45; Deutsch. Med. Woch., 1926, No. 49 and 50.

[2] Adler, A.: Klin. Woch., No. 11, March 12th, 1927, pp. 493, 494.

urine with a high blood-sugar. After four courses of synthalin the glycosuria was reduced to a trace, and the blood-sugar was substantially lower although still above normal at certain times of the day. He had active tuberculosis.

CASE 2.—A woman of 57, with hypertension and obesity. The blood-sugar curve after 50 g. glucose was frankly of diabetic type before synthalin was given; after synthalin the curve, although still abnormal, was much less so.

Cases Receiving Insulin Treatment.

CASE 3.—A woman of 32, taking 35+30 units of insulin to metabolise 30 g. carbohydrate. After four courses of synthalin, a single dose of 20 units of insulin was sufficient to maintain the blood-sugar in the same range without glycosuria. After six courses the patient developed lassitude and nausea, and asked to return to insulin treatment.

CASE 4.—A man of 53, taking 25+25 units of insulin to metabolise 35 g. carbohydrate with normal blood-sugar. The patient has now taken 6 courses of synthalin with 10+10 units of insulin; the carbohydrate has been increased by 20 g., and he remains without glycosuria and with a normal blood-sugar.

CASE 5.—A severe case in a girl of 19, requiring 50+45+5 units of insulin to metabolise 20 g. carbohydrate and keep the blood-sugar normal. After three courses of synthalin the insulin was reduced to 30+25+5 units without harm, but no injection could be omitted.

CASE 6.—A boy of 15, taking 14+12+4 units of insulin to metabolise 32 g. carbohydrate with a normal blood-sugar. After three courses of synthalin, the insulin was successfully reduced to 5+5+5 units. It was not possible to omit an injection, for on 12+12 units of insulin sugar reappeared in the urine.

CASE 7.—A man of 30, who was having a diet containing 120 g. carbohydrate. With 20+20 units of insulin he passed 8 g. sugar. After three courses of synthalin, the glycosuria was rather lower and the blood-sugar was within the same range of limit.

CASE 8.—A boy of 16, who was having a diet containing 45 g. carbohydrate. The blood-sugar was kept within normal limits with 15+15 units of insulin. Synthalin, 25 mg. daily, was then given for three days at a time, with one day's rest. The insulin was gradually reduced to nothing, and the blood-sugar remained within normal limits. After six weeks he had an attack of nausea and vomiting, and synthalin has been stopped temporarily.

CASE 9.—A girl of 6, who was having a diet containing 30 g. carbohydrate. The blood-sugar could not be controlled with 10+10 units of insulin, on account of alternating hyper- and hypo-glycæmia. When synthalin was given instead of insulin, nausea developed together with a severe ketosis. This condition was treated with insulin and subsided rapidly.

Summary of Preliminary Work.—1. Synthalin has an effect on the blood-sugar which is not immediate like that of insulin, but is delayed and more prolonged. 2. Its action does not seem so consistent as that of insulin. 3. In one mild case 30 units of insulin were completely replaced by 25 mg. of synthalin, and the blood-sugar remained normal (Case 8). 4. In three cases a reduction of insulin dosage of 30–45 units was effected by 50 mg. of synthalin, and the blood-sugar remained within normal limits (Cases 3, 4, and 5). 5. In one case 50 mg. of synthalin had about the same effect on the urine sugar as 40 units of insulin, but the blood-sugar was not kept within normal limits (Case 7). 6. In two cases very little effect was apparent, and in a third the condition of the patient resembled that of incipient diabetic coma (Cases 1, 6, and 9). 7. Mild toxic symptoms were observed in two cases, but no decholin was available (Cases 3 and 8).

REPORT FROM GUY'S HOSPITAL, LONDON, BY E. P. POULTON, D.M., F.R.C.P.

The effect of synthalin was tried on two severe cases of diabetes, as there were no elderly cases with a mild diabetes in the ward at the time.

CASE 1.—A boy, aged 10 years, with diabetes for ten months. Two daily injections of insulin were given for a period of three weeks, 26 and 22 units. Then 10 mg. of synthalin were given twice a day for a week, and 20 mg. twice a day for 12 days. The patient began to get mild hypoglycæmic reactions, and the insulin had to be reduced to two doses of 16 and 12 units. The urine was tested at three-hourly intervals during the day, and was usually free from sugar. After omitting the synthalin, sugar appeared rather more frequently. Blood-sugar tests were carried out at 2 P.M. on different days; there was a good deal of variation in the results, but the average of four determinations before synthalin was 0·156 per cent., and during treatment with synthalin 0·135 per cent.—i.e., it was actually a little lower in spite of the insulin being reduced.

CASE 2.—A man aged 30. Diabetes had begun five years ago, and at the time he was treated successfully for coma. He was then treated by dietetic measures. He relapsed into coma associated with sepsis, and was admitted on March 25th, 1927. He required 40 units of insulin twice a day. The urine was nearly always sugar-free when tested at three-hourly intervals during the day. The blood-sugar at 2 P.M. was on an average 0·12 per cent. Synthalin was given in doses of 30 mg. twice a day, and the insulin reduced to 40 units once a day. There was usually some sugar in the 6 A.M. specimen of urine, and occasionally at other times with this treatment. The blood-sugar at 2 P.M. was 0·09 per cent. and 0·16 per cent. on two occasions. After ten days synthalin was omitted, but the insulin kept to 40 units once a day. The sugar came back in the urine in large quantities in every three-hourly specimen obtained during the daytime, and he began to complain of thirst.

Conclusions.—It is very difficult to draw conclusions as regards the effect of synthalin on the blood-sugar by making single determinations at the same time each day. What is really required is a series of determinations carried out through the 24 hours on several days; but so far as our determinations go, they suggest that the blood-sugar was no higher during synthalin treatment in spite of the insulin being lower. The therapeutic action of synthalin in diabetes is also shown by the urine tests and by the hypoglycæmic reactions of Case 1. At the same time synthalin can only be used in severe cases with the object of diminishing the number of injections. It would not be possible to do away with insulin altogether in these cases. These patients did not complain of indigestion with synthalin, but Case 2 complained of a dry throat.

REPORT FROM KING'S COLLEGE HOSPITAL, LONDON, BY R. D. LAWRENCE, M.D., M.R.C.P.

The effect of synthalin has been studied in six fully controlled diabetics by its effect on glycosuria, glycæmia, ketosis, nitrogen excretion, and the clinical condition. Synthalin was given for periods of from five days to four weeks in the fullest doses, 35 to 50 mg. per day, but without the usual pauses recommended by Frank, to obtain the fullest possible action of the drug. Little digestive intolerance has been observed, and no jaundice or urobilinuria. No decholin has been used to push the dosage still higher, because these cases were studied in February and March before the introduction of decholin.

Non-insulin Cases.

CASE 1.—A heavy glycosuria of 30 g. was produced by overfeeding in a mildly diabetic girl. This was reduced to 5 g. after four days of 40 mg. of synthalin and the blood-sugar from 0·25 to 0·2 per cent. but no further. She was subsequently easily controlled by diet alone.

CASE 2.—An excretion of 30 g. of sugar was reduced to 15 g. in a moderately severe diabetic after 45 mg. of synthalin for a week without any obvious change in the blood-sugar (0·22 per cent.) or ketosis. Subsequently 20 units of insulin completely controlled his condition.

Insulin Cases.

An attempt was made to replace insulin by synthalin in three moderately severe diabetics who required from 20 to 35 units respectively, a substitution which the German reports made appear possible. Synthalin alone in the fullest doses failed to control the diabetes, and a heavy glycosuria and ketosis and a marked hyperglycæmia and loss of weight followed in all three cases. On resuming insulin and synthalin together, synthalin seemed to spare 10 units in one case and perhaps 5 units in another. In one case, after stopping the insulin, alternating periods of ten days with and without synthalin were without any appreciable effect on the glycosuria, glycæmia, or ketosis during these periods. In a severe insulin-resistant case (220 units a day) 40 mg. a day of synthalin for three weeks failed to produce any effect in abolishing the need for insulin or sparing it.

Summary.—Among these six cases, it is only in the mild one, which could easily be controlled by diet alone, that synthalin had an important effect in reducing the glycosuria, without, however, making

the blood-sugars normal. In the cases who required even moderate doses of insulin, synthalin has not been able to replace insulin entirely nor to reduce it to one dose a day, which would be of great practical importance. Its continued use in any of the above cases had therefore no obvious advantage. It would seem from these results that synthalin can aid insulin action, if insulin either endogenous or exogenous is available, but cannot replace it. Thus it acted most in the mild case, less in the moderate cases in which it slightly increased the action of exogenous insulin, and failed in severe cases having little insulin.

It would appear probable, from *a priori* reasons and from the reports that synthalin can cause jaundice, that it acts by inhibiting the production of new sugar by the liver, an inhibition of catabolism, probably by a mildly toxic action on the liver cells. It seems unlikely that it can replace the anabolic function of insulin which is so essential to the diabetic. Its action in reducing the appetite may also be of importance in the results observed with uncontrolled diabetics. In my experience synthalin has proved of *no practical use* in the treatment of diabetes.

REPORT FROM THE LONDON HOSPITAL BY O. LEYTON, D.Sc., M.D., F.R.C.P.

I hold the view that in a certain proportion of cases suffering from diabetes mellitus the correct administration of insulin leads to regeneration of the pancreas; therefore I did not feel justified in trying the effect of synthalin upon all cases of that disease, but only when there was some definite contra-indication against insulin.

Amongst the dozen cases submitted to synthalin, (*a*) two were over 70 years old; (*b*) two had unstable metabolism, developing severe hypoglycæmic symptoms without any controllable cause—perhaps the effect of emotion upon absorption; (*c*) four cases had become tired of the frequent hypodermic injections; (*d*) three expressed a desire not to begin insulin, due to their having the incorrect impression that if insulin is begun it must be continued throughout life; (*e*) in one case huge doses of insulin had to be given, and I thought it wise to see whether synthalin could replace some of the insulin and thereby diminish the risk of severe hypoglycæmic attacks.

(*a*) In the two aged cases 25 mg. synthalin twice daily undoubtedly assisted the metabolism, shown by the acetone in the urine disappearing and the patients gaining weight whilst the glycosuria was reduced. The sugar in the blood was diminished but not reduced to normal. One of these cases, a female, developed symptoms which resembled those of acute cholecystitis, which subsided upon my ceasing to give synthalin. If this had been the only case developing such symptoms I should not have attached any importance to it because apparently the patient had had similar attacks in the past. The other case, a man, aged 75, was able to take 25 mg. synthalin daily but developed nausea when taking more. The 25 mg. assisted him to burn sugar but did not render him free from glycosuria.

(*b*) One of these two patients was a man whose work was intermittent and anxious. When at work, even if he succeeded in obtaining food, anxiety might prevent its absorption. Although intelligent and wisely refraining from insulin and food, nevertheless circumstances occasionally were too adverse and he had attacks. He gradually replaced 12 units of insulin twice a day by 25 mg. synthalin, whilst not making any alteration in the diet. The synthalin did not keep his blood-sugar at so low a level as the insulin, but seemed to raise his renal threshold for dextrose. Although the sugar in his blood was often in the region of 0·23 per cent. he did not pass a recognisable amount of sugar in his urine. He maintained his weight. The other, a boy of 14, who had been receiving 10 units of insulin twice daily for many months and had an occasional hypoglycæmic attack. Due to an infection, his condition became worse, and to meet this synthalin was given in addition to insulin with beneficial results.

(*c*) Of the four cases in this group, three were unable to take synthalin because they developed nausea and actual vomiting and this in spite of taking chloretone or dehydrocholic acid. One succeeded in continuing the drug when given two tablets of dehydrocholic acid with each dose of synthalin.

(*d*) A woman, aged 45, on diet C. 62, P. 72, F. 115, with sugar in blood 0·24 per cent. on synthalin 25 mg. twice a day gradually fell to 0·20 per cent. whilst the glycosuria was controlled. Chloretone failed to control the nausea and vomiting; 15 units of insulin twice daily led to hypoglycæmic symptoms developing; 10 units twice daily sufficed to prevent hyperglycæmia. A man aged 56. One year's history, treated by restricted diet. Placed upon a diet C. 67, P. 90, F. 130. Sugar in blood 0·25 per cent. After ten days on synthalin acetone disappeared from the urine, the blood-sugar was 0·24 per cent., and glycosuria persisted. Diet was reduced to C. 55, P. 90, F. 130. After a week traces of sugar were still passed along with a minute trace of acetone. These effects were produced whilst the patient was having teeth treated for pyorrhœa alveolaris. A woman aged 28. Six months' history. Diet C. 29, P. 84, F. 108. Sugar in blood, 0·20 per cent. After six days sugar in blood fell to 0·117 per cent. and glycosuria ceased. Diet then increased to C. 40, P. 84, F. 108. Several teeth extracted during period of treatment.

(*e*) A man, aged 33, with very severe progressive diabetes mellitus, needing more than 40 units of insulin twice daily to prevent hyperglycæmia and acetonuria. He was able to keep fairly well upon 30 units of insulin twice daily with two doses of 25 mg. synthalin. It is true that he developed nausea and a pain suggesting hepatitis. Synthalin was suspended for a time; for the last month or more he has been able to tolerate synthalin without the assistance of dehydrocholic acid or chloretone.

Conclusions based upon a dozen cases would be valueless, therefore I do not draw any.

REPORT FROM THE MIDDLESEX HOSPITAL, LONDON, BY T. IZOD BENNETT, M.D., F.R.C.P.

In the six weeks during which observations have been possible, only one case has been available from which detailed conclusions could be drawn. Six cases in all were observed, and toxic effects in the nature of gastro-intestinal irritation, nausea, vomiting, or diarrhœa were observed in three. These were not serious in degree, but sufficient to terminate the observations. Decholin was not available for use with the synthalin.

The case in which all controls were satisfactory was that of a child, aged 12, who has been under my care for five years. On a diet of C. 50, P. 70, and F. 100, with 15 units insulin, he is sugar-free with normal blood-sugar. Weight, 24 kilos. The insulin having been reduced to 5 units, the blood-sugar rose to about 0·20 per cent. and 20–30 g. sugar were excreted daily. Synthalin in doses of 15, 20, and 30 mg. daily was now given, increasing to the last dose over a period of 21 days. There were no toxic symptoms, and no effect was observed, either in the nature of a diminution in the urinary sugar or in the level of the blood-sugar. The synthalin was then stopped and the extra 10 units of insulin restored. In two days the patient was once more sugar-free with normal blood-sugar. It appears certain that in this carefully controlled case the synthalin was entirely without effect.

In another case it became evident that a reduction in sugar-excretion which had appeared to be due to synthalin was in reality due solely to the "ladder diet." This patient, after becoming nearly sugar-free on a diet of 500 calories, became quite sugar-free on a diet of 750 calories with 50 mg. of synthalin, but increasing tolerance had begun before the drug was given, and after stopping the synthalin the patient remained sugar-free and the diet was raised gradually to 1000 calories without glycosuria returning.

Conclusions.—1. No case has been observed in which a reduction in sugar excretion or of hyperglycæmia could be ascribed to the administration of synthalin. 2. In a most carefully controlled case of severe diabetes, synthalin in full doses appeared to have no effect. A small dose of insulin in this same case produced effect with almost mathematical exactitude. 3. Controls such as absolutely fixed diet over a sufficient preliminary period are essential if correct conclusions are to be drawn as to the possible effects of drugs of this type. 4. The absence of all gastro-intestinal symptoms is a further most important control condition, it being evident that even a slight degree of anorexia or gastro-intestinal disturbance may produce a diminution of sugar excretion. 5. The number of cases at present observed is far too small to permit of any final conclusion being drawn.

A portion of the synthalin received was handed to my colleague, Prof. E. C. Dodds, who tested it on rabbits, both orally and by subcutaneous injection. Oral administration proved ineffective. Given subcutaneously in doses of approximately 5 mg. per kilo body-weight, no effect was observed. In doses

exceeding this death occurred, the blood-sugar, after a preliminary hyperglycæmia, falling to below 0·05 per cent. Intravenous administration of glucose failed to save the animals. Histological examination of the organs is in progress.

REPORT FROM ST. THOMAS'S HOSPITAL, LONDON, BY PROF. HUGH MACLEAN, D.Sc., M.D., M.R.C.P.

Synthalin was tried on eight diabetic patients. The doses were from 10–20 mg. twice daily, with an occasional day on which no synthalin was given. In five of these patients the drug set up fairly marked clinical symptoms within four or five days so that its use had to be discontinued. This toxic action seemed to affect chiefly the gastro-intestinal tract, and the chief symptoms complained of were nausea, anorexia, vomiting, and diarrhœa. Occasionally slight albuminuria was noticed, but this was always in very small amount. Even when no definite symptoms were present several of these patients complained that they did not feel well; they said they were "out of sorts" but could not give a more definite description of their feelings.

In three patients, however, the use of the drug gave rise to no toxic symptoms of any consequence. The plan adopted in these cases was to stabilise the patient on some definite treatment, then to give synthalin; and after synthalin was administered for some time it was withdrawn for a period. The following are the results obtained in these three patients:—

CASE 1.—Aged about 57. This patient had a history of thirst, wasting, and weakness for nine months. On admission to hospital the urine contained large amounts of sugar and diacetic acid. The patient was given a suitable diet and watched for some time. For four days before synthalin was given careful records of the blood-sugar, volume of urine, sugar excretion per day, and acetone secretion per day were kept. The results obtained were as follows:—

Results for Four Days Before Synthalin.

Blood-sugar averaged	0·28 per cent.
Volume of urine	2300 c.cm.
Average sugar in urine per day	75 g.
„ ketones per day	9·6 g.

The patient was then given 10 mg. of synthalin twice a day and records were kept as above. Since synthalin does not appear to act immediately, the results for the first three days on synthalin treatment are given separately. After this the results for the six following days are recorded:—

Average Results for Three Days with Synthalin.

Blood-sugar averaged	0·28 per cent.
Volume of urine per day	1300 c.cm.
Total sugar per day	56 g.
„ ketones „	7·5 g.

Average Results for following Six Days with Synthalin.

Blood-sugar averaged	0·24 per cent.
Volume of urine per day	1200 c.cm.
Total sugar per day	40 g.
„ ketones „	3 g.

After this synthalin was withdrawn. The following are the results obtained for the next four days:—

Average Results for Four Days following Withdrawal of Synthalin.

Blood-sugar averaged	0·3 per cent.
Volume of urine per day	1600 c.cm.
Total sugar per day	70 g.
„ ketones „	5·5 g.

In this patient synthalin had apparently a marked effect on the excretion of ketone bodies. There was also some effect on the amount of sugar excreted. With the exception of some slight feelings of nausea on one or two occasions this patient had no toxic symptoms from the drug.

CASE 2.—This was a severe case of diabetes in a female aged 21. When admitted to hospital the patient was taking 75 units of insulin per day. In this patient blood-sugars were systematically estimated at 10 A.M., 1 P.M., and 4 P.M. each day. For a fortnight she was kept on standard diet with 75 units of insulin per day. After this synthalin was added and given for ten days. The insulin was then reduced to 40 units per day, the same amount of synthalin as before being given. After this the synthalin was cut off. In a few days more synthalin was again added. On the whole the variations in blood-sugar were not very different whether synthalin was given or not, so it is unnecessary to give the figures. The general results obtained in this patient are as follows.

Standard Diet and 75 Units Insulin for 14 Days.

Average amount of urine per day	1900 c.cm.
„ sugar passed per day	48 g.
„ ketones „ „	4 g.

Synthalin, 20 mg., Twice Daily, with 75 Units Insulin, for Ten Days.

Average urine per day	1400 c.cm.
„ sugar „	23 g.
„ ketones „	0·8 g.

Insulin, 20 Units, Twice Daily, with Synthalin as Before.

Average urine per day	800 c.cm.
„ sugar „	10 g.
„ ketones „	0·58 g.

Synthalin, Cut Off; Insulin, 20 Units, Twice Daily as Before.

Average urine per day	1700 c.cm.
„ sugar „	56 g.
„ ketones „	2·7 g.

Synthalin, 20 mg., Twice Daily, with Insulin, 20 Units, Twice Daily as Before.

Average urine per day	800 c.cm.
„ sugar „	40 g.
„ ketones „	0·3 g.

In the case of this patient, although there was no appreciable variation in the blood-sugar, it is obvious that the total excretion of sugar was reduced when synthalin was begin given. The most marked effect of the drug, however, appeared to be on the acidosis. The reduction in the amount of ketone bodies which followed the administration of synthalin is very marked.

CASE 3.—This patient was a female, aged 40, with a history of diabetes of 18 months' duration. In this patient synthalin did not seem to have any marked effect but the drug was not continued for more than five days owing to albuminuria resulting. It is interesting, however, that this patient did not experience any gastro-intestinal symptoms.

Conclusions.—From the point of view of practical therapy, synthalin in its present form is of little or no value because of its pronounced toxicity when given in doses sufficiently large to have an effect on the metabolism. There can be little doubt that synthalin has a very definite though perhaps limited effect in certain cases of diabetes. It appears to reduce to some extent the excretion of sugar and seems to have a very pronounced effect in reducing ketone bodies in the urine and in limiting acidosis. Whether these results are obtainable only in certain patients, or whether all patients react in the same way, was impossible to decide owing to the toxic properties of the drug.

REPORT FROM THE ROYAL INFIRMARY, BRISTOL, BY MAURICE E. J. PACKER, B.Sc., M.B.

Six cases of diabetes mellitus were chosen to represent all degrees of severity of the disease, the patients' ages ranging from 16 to 69. The drug was given by mouth in varying doses (up to 100 mg. in one day), and both with and without insulin. Each case was treated for about three months and frequent blood-sugar curves were taken after the standard meal.

Case.	Age.	Sex.	Weight.	Severity.	Diet in grammes.		
					C.	P.	F.
1	50	F.	12·13	Medium.	93	76	165
2	16	F.	9·8	Severe.	69	57	129
3	59	F.	8·3	Medium.	69	57	129
4	48	F.	12·7	Medium.	93	76	165
5	69	M.	11·2	Slight.	124	101	218
6	54	M.	10·8	Medium.	124	101	218

CASE 1.—With 15 units of insulin b.d. the maximum blood-sugar was 0·278 per cent. with no glycosuria. Synthalin, given in addition, failed to lower the blood-sugar. Glycosuria was caused by trying to replace 15 units of insulin by 75 mg. of the drug every day for three weeks.

CASE 2.—The maximum blood-sugar was 0·260 per cent. with 56 units of insulin twice daily. The addition of 50 mg. of synthalin on alternate days raised her blood-sugar.

CASE 3.—The maximum blood-sugar was 0·289 per cent. with intermittent glycosuria; 50 mg. of synthalin every day did not take the place of 10 units of insulin, for the blood-sugar and glycosuria were increased.

CASE 4.—This patient had not been treated with insulin. She could not tolerate more than 20 mg. of synthalin on alternate days and this dose caused the blood-sugar to fall from 0·279 to 0·250 per cent. A daily glycosuria of about 50 g. decreased to about 20 g. Pruritus vulvæ was not markedly improved.

CASE 5.—His blood-sugar curve (fasting B.S. – 0·185 per cent.) was slightly improved by 20 mg. of synthalin on alternate days. He could not tolerate more. Glycosuria was rarely found before or during treatment. Neuritis was not improved.

CASE 6.—The blood-sugar curve (max. B.S. – 0·286 per cent.) was only slightly improved by 50 mg. of synthalin each day. Diabetic cataracts continued to become worse.

Conclusions.—This short series indicated that: 1. The preparation does not cause a pronounced and sustained fall in the blood-sugar level or glycosuria. 2. Neuritis and pruritus vulvæ of diabetic origin are not improved by the drug. A case of diabetic cataracts continued to become worse. 3. Toxic effects are easily produced, but in time patients are able to stand progressively larger doses. 4. Synthalin (given by mouth) was not a satisfactory substitute for insulin in the cases treated.

REPORT FROM THE ROYAL INFIRMARY, MANCHESTER; THE ROYAL HOSPITAL, SALFORD; AND THE ANCOATS HOSPITAL, MANCHESTER, BY G. J. LANGLEY, M.D., M.R.C.P., AND GARFIELD THOMAS, M.SC.

(The cases at the Manchester Royal Infirmary were made available by the kind coöperation of Dr. F. Craven Moore, Dr. E. Bosdin Leech, and Dr. A. Ramsbottom. Those at the Salford Royal Hospital and Ancoats Hospital were under the care of Dr. Langley.)

Nine cases have been treated. Two children, ages 13 and 15 years; four young adults, ages 24, 28, 34, and 37 years; and three in late middle age—i.e., two aged 51, and one 67 years.

Progress has been estimated by determination of the blood-sugar, the examination of the urine, maintenance of the body-weight, and general condition of the patient.

In the cases treated at Ancoats and Salford Hospitals the blood-sugar was estimated two-hourly except at night. The general plan was to build up the patient's diet with an adequate dose of insulin and then when balance had been established to change over to synthalin by Frank's method, the diet remaining unchanged. Periodical remission of the synthalin, as recommended by Frank, was carried out. Two of the cases have been under synthalin treatment for 11 and 12 weeks respectively, and the other seven for nearly four weeks.

In the two children and two of the young adults synthalin failed to control the disease—i.e., it was not possible to replace the insulin with the equivalent or more than equivalent dose of synthalin (50 mg. daily was not exceeded) and maintain the blood-sugar at a satisfactory level. In one of these cases, a moderately severe type, the toxic effects of the drug when 50 mg. daily were being given, necessitated a return to insulin. Decholin was not available.

In one of the young adults, a female, aged 28, 30 units of insulin daily have not been replaced satisfactorily by 50 mg. of synthalin because the blood-sugar has shown a tendency to rise. In this case judgment must be reserved until a later date.

One of the young adults, a butcher, aged 37, admitted in coma, was brought into balance with 70 units of insulin daily. This patient has had synthalin for 12 weeks, 50 mg. being given to replace 40 units of insulin. His balance has been maintained, and his condition is satisfactory.

Of the three older patients, one brought into balance with 40 units of insulin per diem has had this satisfactorily replaced by 50 mg. synthalin. The blood-sugar has kept within normal limits, the patient's weight is maintained, he has had no toxic symptoms, and is back at work. Another of the older patients requiring 24 units of insulin daily had this replaced by a single dose daily of 25 mg. of synthalin. After apparent successful replacement lasting nine days, acute toxic effects were produced and the drug was stopped. In this case, after cessation of the vomiting and diarrhœa, the blood-sugar has remained normal for a period of ten days *without either synthalin or insulin.*

The third case in this group was a patient, aged 67, who had been operated on for diabetic gangrene, the diabetes being controlled by 40 units of insulin. This was successfully replaced by 50 mg. of synthalin. After eight days half this dose was found to be equally successful, and for a further 12 days neither drug has been used. The blood-sugar has remained normal and weight has been maintained.

Summary.—It will thus be seen that in four out of the nine cases the synthalin has been unsuccessful. In one, the result is as yet doubtful but promising. In two others, the synthalin has replaced insulin apparently satisfactorily, but in one of these insulin is still required though in a smaller dose than previously. Finally, in two more cases, control appeared to have been established with synthalin, but on ceasing to administer either synthalin or insulin the blood-sugar remained normal. This is in accordance with the general experience that the diabetic in later middle life after insulin treatment for from three to four weeks will remain sugar-free and comfortable for a considerable period without continued insulin. On the other hand, it is known that the effects of guanidin last for a long time, and this may be true of synthalin. In two of the cases toxic effects were produced, and the treatment had to be abandoned on this account.

REPORT FROM THE ROYAL INFIRMARY, EDINBURGH, BY PROF. D. MURRAY LYON, D.SC., M.D., AND W. ROBSON, PH.D., M.SC.

Papers already published regarding the value of synthalin in diabetes are unconvincing because sufficient care does not appear to have been given to control of the diet during the tests. In many of the cases illustrated the composition of the diet has been varied from day to day, allowing insufficient time for thorough stabilisation. The full effect of an alteration of the food intake does not become at once apparent, and a steady balance may not be reached for a week after a change has been made. In submitting a new drug to clinical test it is essential that the effect of other variables be avoided, and in the case of an insulin-like body this necessitates a rigid control of the diet during the period. For these reasons, cases of considerable standing who had been under observation for a long time were chosen. The patients were already stabilised and sugar-free on a standard diet of definite caloric value either with or without the aid of insulin. By raising the diet or by reducing the insulin a small quantity of sugar was then allowed to appear in the daily sample of urine, and the patient was stabilised afresh during a week at this new level. Synthalin was then administered over periods of from five to seven days, and this was followed by similar periods without and with synthalin. Under these circumstances there appeared to be a slight reduction in the quantity of sugar excreted under synthalin, but traces of glycosuria were never finally got rid of. In none of the five cases so examined has the effect been striking. On the other hand, three of the patients have been a good deal upset by the drug. Headaches were frequent and severe, and there has been considerable nausea, retching, and vomiting. At times the observations have been rendered doubtful by the patient losing food through anorexia and vomiting, or through failure to digest it completely. Those symptoms are so disturbing that they will restrict the free use of the drug, should it prove to possess the other actions claimed for it.

One other case has been treated with synthalin from the beginning. He was put on a diet of 2000 calories containing 68 g. of carbohydrate, and this has been kept constant throughout the investigation. During five days without synthalin the daily loss of sugar fell from 400 to 300 g. Synthalin was then given for eight days, and the daily output gradually fell to about 30 g. A period of seven days without synthalin followed and the sugar loss further diminished to 9–20 g. a day. Observations are being continued. How much of this improvement is to be attributed to continued use of the rather low diet, and how much to the drug, is not yet apparent. Synthalin merits further investigation, but our experience of it up to date is not sufficient to allow of any opinion as to its real value.

THE CAMPAIGN AGAINST MALARIA.

THE Second General Report on the Principles and Methods of Antimalarial Measures in Europe[1] has just been published by the Malaria Commission of the League of Nations, and is dedicated to Dr. N. V. Lothian, Dr. S. T. Darling, and Mlle. A. Besson, who died whilst travelling on duty on Lebanon. The collective study-tours undertaken by the Commission have for the first time enabled malariologists of different countries and of different schools of thought to study local problems on the spot. Individual views have become modified and the conclusions reached in most cases represent an average opinion which probably approaches the truth. Their significance is obvious, and they do not apply to Europe alone.

Only very rarely, it is pointed out, can there be any question of converting a malarial into a non-malarial place; an alteration of this kind can be effected only by a complete change in the character of a site such as has occurred in the course of centuries in London and Rome. In the Panama Canal zone, for instance, the locality has not been essentially altered, and malaria is merely being held in check; were protective measures to cease, the disease would again become devastating. Save in very exceptional cases, therefore, it is unwise to aim at more than a significant reduction in malaria—that is to say, a reduction which will make it of little or no importance as a cause of sickness and death. As regards the means by which this may be accomplished, the startling statement is made that there are localities where hardly anything has retarded the effective control of malaria so much as the belief that, since mosquitoes carry the infection, their elimination should be the object of chief concern and expenditure. In England, the Netherlands, and Denmark malaria was robbed of its importance at a time when its epidemiology was unknown, and when there was no reduction of mosquitoes, and the Commission has seen the same thing happening in Europe to-day.

Of the measures which may be employed for the lessening of malaria, there is none which can be described as the method of unquestioned choice, and the one selected must depend on local conditions. Yet such measures do fall into two great categories, designated direct and indirect, these terms being used in rather special senses. The direct measures of the Commission are those which kill malaria parasites, either in man by the treatment of infected persons, or in anopheles by the destruction of infected mosquitoes in houses. In the opinion of the Commission, these direct measures are primary and always indispensable; the others are adjuvant. The old aim—to break the chain somewhere—is replaced by a new one, to kill the parasites themselves. Nor is it held advisable that too many different measures of control should be put into operation at the same time. It is better to carry out one or two thoroughly, for experience has shown that for every measure there is a "minimum effective degree of perfection," and if it is not carried out with a certain degree of thoroughness then it is of no use at all.

For the destruction of plasmodia in the human body it is stated that quinine, quinidine, and kinetum are of almost equal efficiency in dosage of 1 g. daily, while cinchonine falls into the same category if the dosage is increased to 1·5 g. Quinidine is the strongest cardiac depressant. Kinetum consists almost entirely of residual alkaloidal bases—the composition of the tested samples being: quinine 15, cinchonidine 35, cinchonine 25, quinidine 5, and quinoidine 20 per cent.—and it must, therefore, be concluded that a standard preparation of the principal alkaloids, purified only so far as to exclude the more toxic constituents, is as efficacious as quinine. This conclusion replaces the cinchona febrifuge of India and Java in its old eminence, always provided that it can be standardised; and it is also important because employment of these total alkaloids, in place of pure quinine, would greatly enlarge the amount of specific antimalarial alkaloid at present available for world use, and—apart from commercial rings—should correspondingly cheapen the cost of treating the disease. The demand for, and so the cost of, cinchona alkaloids will be further reduced by the Commission's pronouncement that "prophylactic quinine" in the usual preventive doses does not prevent malaria, and merely does something to keep in abeyance an infection which has become established. In these ways more and cheaper alkaloid should become available for use where its action is most greatly to be desired. All this implies the primary importance of diagnosis, and the Commission indicates administrative methods which would make for its accuracy.

The procedure advised for directly attacking plasmodia in anopheles starts from the fact that, in Europe at any rate, the majority of infected mosquitoes are found inside houses. Many a housewife offers to *Anopheles maculipennis* the amenities of cobwebs, dirt, dark corners, and shady cupboards, whereas the gorged, sluggish, and probably infective mosquito ought really to be regarded with as much disfavour as the bed-bug and the louse. It is difficult to exaggerate the importance of their destruction, and at least they ought to be put to all possible discomfort by house-cleaning and whitewash. It may also be noted that the Commission is satisfied of the usefulness of the suggestion—associated particularly with the name of Roubaud—that a damp, dark, still animal house situated between a breeding-ground and the home will divert the insects to a harmless vicarious meal.

With regard to indirect antimalarial measures the Commission states that in all its journeys only two regions have been found where efforts of this kind on a large scale have been definitely successful—namely, in the Karst Mountains of Dalmatia, and in parts of Palestine. In both of these areas water is extremely scarce, strictly localised, and readily controlled. The report returns to the subject of Italian bonification, which signifies all work carried out with the object of making regions which are periodically or permanently marshy, more suitable for agriculture and more healthy. The means adopted are not essentially antilarval, and indeed they often increase, by the use of drains, the total area available for anopheline breeding. Their object is primarily social—that is to say, they change a poor, sparse, scattered, often semi-nomadic, population into one which is settled, well-to-do, and aggregated into villages, and has schools, doctors, water-supply, proper sewage disposal, and houses of an enforced hygienic standard. With a change of this kind malaria is lessened.

Finally, the Commission emphasises the great need for continued research. It is remarked that the conveyance of malaria in the natural way by mosquitoes in this country, in cases of general paralysis, has enabled English workers to make certain valuable and unique observations. The unnatural method of infection practised elsewhere—namely, injection of the blood of a malarial subject—has not permitted similar studies abroad. These observations, together with an account of work in the Netherlands, Roumania, and Italy are embodied in the report, and the whole forms one of the most stimulating publications on malaria that has appeared in recent years.

[1] Obtainable in Great Britain from Constable and Co., Ltd., Orange-street, London, W.C. 2.

KING'S COLLEGE HOSPITAL. — King's College Hospital will require a larger income this year than its total of £102,554 of last year if it is to meet the cost of additional beds and the pension scheme. The necessity of completing the building, owing to the demands of the ever-increasing population of South London, is strongly emphasised by the Committee. The in-patients treated last year numbered 6055 and the number of new out-patients 34,492.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Medical Registration.

THE first step in the formation of the Irish Free State Medical Registration Council was taken last week, when the election of two direct representatives of the medical profession was completed. Three candidates were nominated—namely, Mr. P. E. Hayden, F.R.C.S.I., Prof. M. R. J. Hayes, F.R.C.S.I., and Prof. R. J. Rowlette, F.R.C.P.I. There are on the Register some 2900 practitioners entitled to vote. Of these, only about half returned voting papers. The count showed 1141 votes cast for Mr. Hayes, 936 for Dr. Rowlette, and 552 for Mr. Hayden. Mr. Hayes and Dr. Rowlette were, therefore, declared elected. Invitations have been issued by the Minister to the several educational bodies who are entitled to nominate representatives to notify him of the names of their nominees. When these have been received the Executive Council will complete the Council by two further appointments.

Election of Mr. T. Hennessy to the Dail.

Mr. T. Hennessy, F.R.C.S.I., has again been elected a member of the Dail. He had been one of the deputies for South Dublin City from early in 1925 up to the General Election, when, acting on medical advice, he refused to go forward again as a candidate. A vacancy having since occurred in his old constituency, he consented, at considerable personal inconvenience, to contest the seat. His many friends in the medical profession rejoice that he was successful, winning for the Government Party by a larger majority than was expected. It is somewhat hard on him that the Dail should have been dissolved immediately after his election, as he will have to face another election in a fortnight's time. The medical profession, regardless of party, recognise the importance of having in the Dail a medical man of the authority and influence of Mr. Hennessy, and his return at the general election is to be hoped for.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Vital Statistics.

THE birth registration area last year comprised 28 States, and within this area 1,597,903 births were reported, giving a general birth-rate of 20·1 per 1000, as compared with 21·1 during 1925. Florida has the highest birth-rate (26·4), perhaps as a result of the recent boom, and is the only State where there has been an increase. Florida also shows the highest death-rate (15·3). The general death-rate for the registration area has increased from 11·7 per 1000 in 1925 to 12·1 in 1926, and infant mortality has increased from 71·5 to 72·8 per 1000 births for the same years. Arizona, which is becoming popular as a health resort, has the highest infant mortality (119·5) of any of the 28 States reporting. Homicide is more than ten times as common as in England, and even when the coloured population is excluded the rate remains seven times that for England and Wales. For 28 cities with an aggregate population of nearly 23,000,000 the murder death-rate was 9·9 per 100,000, as against 11 per 100,000 in 1925. Compared with the previous year there has been a decrease in Chicago from 18·8 to 16·7, in New York from 6·4 to 5·7, and in Philadelphia from 9·7 to 8·6. Dr. F. L. Hoffman, commenting in the *Spectator* on the 1926 homicide statistics, remarks that capital punishment is apparently no deterrent, for there is, generally speaking, a higher murder death-rate in the States which enforce it.

Industrial Morbidity in Ohio.

The Industrial Commission of Ohio is authorised to set aside from the State insurance fund a sum of money not to exceed 1 per cent. of the annual contributions made by employers for the investigation and prevention of industrial accidents and diseases. With this fund the commission has set up a division of safety and hygiene including statistical, medical, and research branches, and the first comprehensive study of the industrial morbidity of the State has now appeared.[1] Between July 1st, 1921, when the compensation law became effective, and Jan. 1st of the present year, 4443 claims have been filed. These claims have been classified according to the nature of the disease or accident, the industry in which it occurred, and the duration of disability. From the last point of view lead-poisoning is found to be the most serious cause of economic loss, 907 claims showing a total loss of 277,112 days. This figure includes fatalities (37) and permanent disabilities, the time-loss for which is calculated according to the scale of weights recommended by the International Association of Accident Boards and Commissions. Skin diseases, on the other hand, were responsible for the largest number (3005) of claims, but for a total loss of only 86,253 days. Most of the cases in this group (2890) were due to dermatitis from various irritants, including gases, dusts, and oils. The duration of disability from this cause was less than one week in 57 per cent. of the claims. A number of claims were filed which cannot be compensated under the present law, including 75 for tuberculosis, with 14 deaths. Although this list is obviously incomplete it has also been classified and the results included in the tables. The total loss of time by all compensable claims was 760,069 days, and the total medical expense for treatment of these cases was $98,866. Unfortunately the number of insured persons is not given either by industries or in total.

During the past year 3692 claims have been made for injuries to minors (under age 18), of whom 3139 were males. As many as 233 claims were for children under 16 years of age. Classification of the claims shows that a number of minors must be illegally employed. For example, no child under the age of 18 years may oil or clean machinery while in motion, or operate abrasive wheels in the manufacture of metal articles, yet a number of accidents occurred to minors while engaged in these occupations. The causes responsible for the greatest frequency of accidents are given as handling objects (839 accidents), machinery (831), stepping upon or striking against objects (485). The causes responsible for greatest severity of accidents are motor vehicles (21,034 days), elevators (20,781 days), and machinery (19,880 days). The accidents by machinery are further classified according to the type of machine. Once again the value of these tables is diminished by our ignorance of the numbers exposed to risk.

Immunisation against Diphtheria.

The Board of Health of the State of Virginia has devised a plan for encouraging the general use of toxin-antitoxin for the prevention of diphtheria. Attached to every birth certificate is a piece of paper bearing the legend: "When the baby is six months old have your doctor give toxin-antitoxin to prevent diphtheria.—United States Public Health Service." The Federal authorities recommend that other States should follow this example.

A Campaign against Venereal Disease.

In the *Chicago Evening American* for August 8th appears a full-page advertisement of a public health institute, organised for public service as a corporation not for profit under the laws of the State of Illinois. The names of the trustees of the institute appearing at the foot of the advertisement are those of prominent business men in the city. "It's a crime," the headline reads, "to expose innocent women and children to the ravages of 'social' diseases." Advice is given on the contagiousness of these diseases, an illustrated booklet is offered free to applicants, and

[1] Special Bulletin No. 1. The Industrial Commission of Ohio, 1927.

the addresses of three treatment centres are given with the assurance that the treatment will be given privately by competent physicians at prices which all can afford. This is an interesting, because rare, example of a local public health organisation founded and sponsored by the laity from a sense of public responsibility.

A Notable Propagandist.

The return of Dr. W. W. Peter from China recalls his remarkable health campaign at Foochow in 1920. During a single week 110,000 people were reached through 247 meetings, and the result was practically to eradicate cholera from a city where it had long been endemic, and where in 1919 there had been no less than 18,000 cases. Dr. Peter has now joined the staff of the American Public Health Association as associate secretary.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some of the statistics for 1926 of three Scottish towns :—

Name of district and mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Resp. diseases with influenza.	Heart disease.	Diarrhœa under 2 years.	Infant mortality.	Maternal mort. from childbirth.
Glasgow .. .. (1,101,622)	22·1	14·2	1·17	1·26	2·8	1·4	6·5	104	6·3
Aberdeen .. .. (158,723)	21·5	13·3	1·15	1·33	1·67	—	4·5	96	5·9
Paisley .. .. (86,103)	22·4	14·2	1·03	1·68	2·7	1·5	9·8	114	4·7

The population of Glasgow, as shown, is a local estimate. The Registrar-General's estimate is lower, and makes the birth-rate 23·5 and the death-rate 15·1. The neonatal rates in the three towns are: Glasgow, 37; Aberdeen, 35; and Paisley, 47. A table in the Aberdeen report gives the death-rates from all causes in the six chief Scottish towns, when corrected for age and sex distribution, as: Glasgow, 17·0; Edinburgh, 13·7; Dundee, 14·8; Aberdeen, 13·4; Paisley, 15·6; and Greenock, 15·0. It is to be hoped that after the 1931 census the discrepancy between central and local estimates of population will disappear. An over-estimate of the population is perhaps more dangerous than an under-estimate, as it may lull the local health authority to a sense of false security.

Glasgow.

Dr. A. S. M. Macgregor's report is a volume of 375 pages, which includes many interesting special reports by members of his staff. By the Glasgow Boundaries Act of 1925 10,328 acres were added to the city. The population of the added area was only two persons per acre, whereas that of the 19,183 acres of the old city was 57. The average density of the extended city is therefore 38 persons per acre. The number of empty houses in the old city in 1926 was 408, and in the extended city 421; in 1913 the number of empty houses in the old city was 18,710. A total of 6796 linings for new houses were granted by the Dean of Guild Court, a much higher number than in any year since the war, although, says Dr. Macgregor, "the rapidity with which the shortage is being overtaken is not yet sufficiently great." The worst feature of the housing situation is the intense overcrowding of the small houses. The effect of some of the slum clearance schemes is illustrated by plans and photographs. A scheme came into operation on July 1st, 1926, for the admission of candidates from Glasgow and south-west Scotland to the Royal Blind Asylum for training. During the last half of the year 49 applicants were dealt with, of whom 14 were found not to be blind according to the standard adopted. The causes of blindness in the 35 candidates accepted were as follows: Congenital cataract, 2; senile cataract, 3; albinism, 1; aniridia, 1; syphilis, 11; gonorrhœa, 4; measles, 2; pneumonia, 1; glaucoma, 1; injury, 2; and cause unknown, 7.

A booklet has been prepared during the year describing the maternity and child welfare scheme with all its ramifications. A chart showing the infant mortality-rate since 1890 shows the large oscillations which occur from year to year, "due to the effect which infectious and respiratory diseases have on infant life." During 1890 to 1900 the oscillations were round about 150; now they are round about 100. Dr. Macgregor states that a study of the last epidemic shows that under the close association permitted by tenement life in closely congested areas, measles, with its complication broncho-pneumonia, attacks the children at an age when they are relatively powerless to resist it. Another chart in the report shows the regularity with which an outburst of measles occurs every alternate year. An effort is being made to secure better coöperation with the education authority by the establishment of joint clinics. An illustration is given of the new welfare centre opened at West Govan during the year. There are now 14 centres at which consultations are held, and the child welfare staff includes 10 lady doctors and 29 nurses. An investigation has revealed the fact that between 4 and 5 per cent. of the children attending the welfare centres suffer from some degree of otorrhœa. It was noted that in 48 per cent. the condition began in the first year of life (in 22 per cent. before the end of the sixth month); in 27 per cent. during the second year; and in the remaining 25 per cent. between the third and fifth years. In 70 per cent. of the cases occurring before the end of the second year the cause given was either dentition, debility, or unknown. In about 19 per cent. of all the cases disease of the naso-pharynx was stated to be the cause, whilst in 12 per cent. one of the infectious diseases—measles, scarlet fever, whooping-cough, diphtheria—was stated to be the cause. In more than half of the cases the otorrhœa was associated with enlarged tonsils and adenoids. The number of women who have attended the antenatal dispensary shows an increase from 3878 in 1925 to 4266 in 1926, and 866 cases were admitted to the antenatal wards in 1926 as compared with 730 in 1925. Antenatal consultations are now held at six centres, and the primary attendances at these centres numbered 2144 during the year, about 15 per cent. of the patients being primiparæ. The maternal death-rates per 1000 births during the last five years 1921–25 have been: in Glasgow 6·39, 7·60, 7·08, 5·84, and 7·63; and in Scotland 6·38, 6·60, 6·42, 5·82, and 6·16. During the last six years the death-rate from puerperal sepsis in Glasgow is given as 2·32, 3·00, 2·55, 2·21, 2·32, and (in 1926) 2·8. Dr. Macgregor points out that increase in cases indicates an improvement in notification. Of the 24,000 births over 11,000 were attended by midwives, who sent for medical help in 25 per cent. of their cases. Only about 13 per cent. of the ophthalmia neonatorum swabs examined were found to be gonococcal. The gonococcal cases numbered 99 and the resulting damage to eyesight was blindness in one eye in two cases and corneal scars in two others. The 386 non-gonococcal cases recovered without injury to eyesight. A maternity home had to be closed during the year owing to a serious outbreak of puerperal fever. There were ten cases of puerperal fever with four deaths and two cases of erysipelas with one death. The home was a well-equipped one, with accommodation for 20 patients, but the incident "raised important questions of medical administration concerned chiefly with late diagnosis and notification and certain details connected with the management of patients."

These defects were remedied in a thoroughly satisfactory manner before the reopening of the home.

Typhus fever returned after an absence of three years and there were eight cases. The disease was mild in the younger patients, but severe in the older, and resulted in one death. The outbreak has been fully reported in THE LANCET (1927, i., 887). The notifications of enteric fever numbered 100, as compared with 44 in 1925. Among the 362 contacts examined bacteriologically five gave positive results. Two of these had had missed mild attacks; one was a true carrier who had had enteric fever 23 years ago; the fourth was a carrier detected in 1922; and the fifth was an example of a urinary type of carrier. He was admitted to hospital in April, 1926, and discharged after three negative specimens of urine and fæces had been obtained. After his discharge his mother and three brothers and one sister became infected, and *Bacillus typhosus* was found to have reappeared in his urine. Treatment with vaccines and antiseptics had little effect, and on Jan. 28th, 1927, he was admitted to Belvedere Hospital for special treatment. A small outbreak of diphtheria was traced to a carrier in the person of the proprietor of a dairy. He continued to be a carrier in spite of five months' treatment with antiseptics, after which a two months' course of treatment with detoxicated diphtheria vaccine appeared to be effective in rendering the swabs negative. There were 109 notifications of encephalitis lethargica, of which 43 were true cases. Only 20 out of the 43 actually sickened during 1926. The others were cases missed in the early stage, which were notified in order to gain admission to Stobhill Hospital, where some 60 beds have been set aside for post-encephalitis.

A case of anthrax occurred in Manchester about the beginning of April, and a case which proved fatal occurred in Glasgow on August 1st. Both were traced to shaving-brushes imported from Czechoslovakia. A considerable consignment of these brushes arrived in the country and was distributed in all directions. The shaving-brush was made of horsehair dyed to imitate badger, the handle being of white enamelled wood with a white label inscribed in red letters: "Guaranteed free from anthrax." The retail price was about 6*d*. The matter was reported to the Czechoslovak Consul. The first sample brushes examined in Prague gave negative results, but later ones proved positive, and stringent precautions were at once taken to prevent recurrence.

There were 25 notifications of trachoma, for which disease a special hospital ward is provided at Ruchill. During 1926 treatment by ultra-violet light was made available for the trachoma patients, and appears to give better results than have hitherto been obtained by operative methods, especially in the case of pannus of the cornea.

The question of dealing adequately with persons suffering from venereal diseases who refuse to undergo treatment is discussed in the report. A conference of the local authorities of Scotland was held in Glasgow in March, 1923, and Dr. Macgregor thinks that another representative meeting should be convened in order to consider whether a joint course of action can now be agreed upon.

The interlocutor and note of the sheriff with regard to the mosquitoes on Bogton Marsh are given in full.[2]

Aberdeen.

Dr. J. Parlane Kinloch shows that, in addition to the immunisation work against diphtheria and scarlet fever carried out by the staff of the health department, the medical practitioners of the city performed 314 Schick tests and 1069 Dick tests. They immunised 132 persons against diphtheria, 293 against scarlatina, and 1800 persons against combined diphtheria and scarlatina.

During 1926 44 cases of dysentery were notified, of which 27 were infections with the Sonne bacillus, 12 with the Flexner bacillus, 1 with both Sonne and Flexner bacilli, and 3 with cysts of *Entamœba histolytica*. In the remaining case the bacteriological examination gave a negative result. Evidence is accumulating which goes to show that summer diarrhœa in Aberdeen is due to the Sonne bacillus, and arrangements are in force by which cases will be largely removed to hospital with a view to further investigations of the relation of this disease to infection with the Sonne bacillus.

In the 1925 annual report an estimated need for 5000 new houses was indicated. A further comprehensive survey of the city's housing requirements made during 1926 shows that this estimate is, if anything, under the mark. The survey has also revealed the fact that 43 per cent. of the new houses are occupied by persons who have not released another house for occupation. The town council have authorised the building of 1000 dwellings in 250 blocks, each containing four three-roomed flats, as a first instalment towards the shortage. Only 25 per cent. of the patients with notified pulmonary tuberculosis were found to be occupying a separate bed in a separate room, and more than 50 per cent. had not a separate bed. At the end of the year 106 beds were on loan with bedding. The loaned beds and bedding are well cared for and nearly always returned in good and clean condition.

The chief cause of mortality among infants in 1926 was, as usual, prematurity, which accounted for 69 deaths, about three-quarters of them occurring within the first week. The second chief cause was respiratory diseases with 58 deaths. The total of infantile deaths was 328. Midwives attended about 20 per cent. of the confinements in the area, and sent for medical help in about 27 per cent. of their cases. There were 3406 births, and 1079 expectant mothers sought advice at the antenatal clinics. The dental and ophthalmic clinics are run jointly by the education and health committees. The marasmic ward at the city hospital admitted 170 infants chiefly suffering from nutritional disorders; 116 were improved, 22 died, and 32 were discharged at the request of the parents. During 1926 90 milk samples were examined for tubercle and 7 (or 7·8 per cent.) gave a positive result. There are now only 18 dairy herds in the city, the average number of cows being 197. The herds are inspected once a month.

During 1926 there were 36 notifications of puerperal fever with eight deaths, the figures for the preceding five years averaging 15 and 9 respectively.

Paisley.

Dr. G. V. T. McMichael reports that the usefulness of the isolation hospital is to be greatly increased by the provision of eight single-bed cubicles for the scarlet fever ward, two single-bed cubicles for the diphtheria ward, and an operating theatre adjoining the ward which is to be used for puerperal fever. He lays stress on the fact, however, that a new modern fever hospital should be provided on the outskirts of the town. Two-thirds of the 342 notified cases of acute primary and influenzal pneumonia were admitted to three hospitals. The case-mortality of the hospital cases was 27 per cent., while the case-mortality of the 158 cases treated at home was 48 per cent. The use of scarlet fever antitoxin in the isolation hospital appeared to cut short the acute stage in severe cases of scarlet fever, but did not seem to lessen the incidence of complications. Prophylactic doses were found useful in preventing cross-infection. New probationers are immunised, if found susceptible by the Dick test. Of the 54 notified cases of ophthalmia neonatorum 18 showed a gonococcal origin. There was no serious impairment of vision from this disease. During February and March measles was very prevalent; there were 1512 cases with 37 deaths, all except one under 5 years old. At the height of the epidemic all the health visitors assisted the epidemic nurse in the visitation of cases. The special provision for puerperal fever includes a ward at the hospital with

[2] See THE LANCET, June 25th, p. 1366, and July 9th, p. 81.

a specially qualified nurse in charge and the services of the consultant obstetric surgeon at the Barshaw Hospital for Women and Children. The attendances at the antenatal and child welfare clinics continue to increase. The provision for maternity cases at Barshaw Hospital has been increased from 18 beds to 30, and during 1926 the admissions to the antenatal wards numbered 122. The first attendances at the antenatal consultations numbered 278, and in addition 294 antenatal cases were seen at Barshaw Hospital. The total births were 1929.

The Russell Institute was formally opened by Princess Mary on March 19th, 1927, and serves as a central institution for all the various health services of the burgh. The domiciliary treatment of consumption is a special difficulty in Paisley owing to the high proportion of one- and two-apartment houses. The difficulty is only partially met by three local voluntary agencies, whose funds are available for helping cases of tuberculosis. Encouraging progress is being made with the various corporation housing schemes.

Dr. McMichael's estimateof the houses required to meet the needs of the district at the end of the year was 921.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 20TH, 1927.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 103 (last week 127); scarlet fever, 1236; diphtheria, 672; enteric fever, 96; pneumonia, 466; puerperal fever, 35; puerperal pyrexia, 90; cerebro-spinal fever, 4; acute poliomyelitis, 21; encephalitis lethargica, 31; dysentery, 13; and ophthalmia neonatorum, 109. No case of cholera, plague, or typhus fever was notified during the week.

Deaths.—In the aggregate of great towns, including London, there were no deaths from small-pox, 2 (1) from enteric fever, 19 (0) from measles, 8 (5) from scarlet fever, 13 (5) from whooping-cough, 13 (2) from diphtheria, 50 (8) from diarrhœa and enteritis under 2 years of age, and 21 (1) from influenza. The figures in parentheses are those for London itself.

NURSERY PROBLEMS.—A series of lectures on this subject will begin on Oct. 19th, at 3.15 P.M., at 117, Piccadilly, London, W. Among the lecturers will be Dr. Eric Pritchard, Dr. J. A. Hadfield, Dr. Crichton Miller, Dr. D. W. Winnicott, Prof. R. H. A. Plimmer, and Dr. Leonard Williams. Particulars may be had from Viscountess Erleigh, 65, Rutland-gate, S.W.

THE FABRIC OF ST. THOMAS'S HOSPITAL.—In his annual report Sir Arthur Stanley writes that "amongst the repairs executed during the year has been the rebuilding of all chimney stacks. It was found that these were showing signs of weakness, attributable to two main causes: (1) The deterioration of the mortar; (2) to the increasing vibration which is distinctly affecting the whole of the building. The greater part of the hospital is built on made-up ground reclaimed from the river bed when the Albert Embankment between Westminster Bridge and Lambeth Bridge was built. Great care was taken at that time to provide efficient concrete foundations, and it is impossible to conceive that these foundations could have been more efficiently laid; but the vibration caused by the weight and rapid pace of increasing traffic throws a severe test on buildings, however admirably they may have been built 50 years ago." The consulting architect states, however, that the building is structurally perfectly sound. The income of the Hospital last year was £156,555 and the total expenditure £176,199. For the next six and a half years St. Thomas's will receive from Mr. W. R. Morris a contribution of £16,000 per annum. The sum of £30,000, in part contributed by the trustees of the Rockefeller Foundation, and in part by the medical and surgical teaching staff, is available for the erection of an unit laboratory. During the year 11,243 patients were treated and the daily number of in-patients was 547.

Correspondence.

"Audi alteram partem."

POOR-LAW HOSPITALS.

To the Editor of THE LANCET.

SIR,—Your correspondents in THE LANCET of August 6th who took exception to the phrase "professional degradation," applied by Mr. Hamilton Bailey—who is himself a surgeon to the Dudley Road (Birmingham Union) Hospital—to the position of the Poor-law medical officer, have evidently misunderstood his attitude. Far from attacking the staffs of Poor-law hospitals, Mr. Bailey's object is obviously to raise their prestige and status. Hampered for years by those unfortunate terms, "Poor-law," "workhouse," our infirmaries and their staffs, however efficient, have not received the recognition which is their due either from the profession or the public at large. The only arbiters of professional status, the profession and the public, do not recognise or appreciate at their full worth our infirmaries and their medical officers, and it follows that so far as prestige is concerned "professional degradation" becomes, sooner or later, the unenviable lot of those who staff these institutions. This attitude will continue as long as the guardians hold administrative qualifications as alone worthy of recognition and advancement, rather than executive professional skill and experience. The remedy is clear. The stigma of Poor-law must be removed from our infirmaries, and the members of the staff must be given free scope to exercise and prove their professional ability to their colleagues and to the public. To the profession, apart from technical skill, teaching, research work, and literary output are the only recognised index of efficiency and status. Our infirmaries offer a vast, but neglected, field for teaching purposes, in many directions more suited to this purpose than some voluntary hospitals. The material is there and the staffs are competent. Why are they not recognised as teaching centres? Research work, again, is not the monopoly of any hospital—*all* hospitals should make it their chief and glorious aim. Why is not research encouraged, and why are not more results forthcoming from amongst the unique and varied material at our large infirmaries? One reason is that research work entails systematic records, and that adequate encouragement and provision for keeping records is lacking at our infirmaries.

In order to increase the prestige of the medical officers of our infirmaries with the general public, they should be allowed and even encouraged to compete for and hold appointments upon the staffs (in specialist departments) of our voluntary hospitals. Also some opportunity for private practice should be permitted to the senior members of the staffs of our infirmaries, in order that they may obtain the stimulus of healthy competition and the reward of enterprise. Denied these incentives, they are likely to drift into that state where "what might have been" becomes beyond their reach, and "professional degradation" begins to set in. So true has this prognosis proved in a succession of brilliant medical officers at one of our large infirmaries that the clerk to the guardians decided to devote his 25 years' experience and influence to counteract such happenings in the future, at any rate in the infirmary to which he is attached. He had observed the initial enthusiasm, keenness, and capability of a succession of men selected for this work in open competition with other candidates, and had observed and lamented that their early promise was not fulfilled. After repeated attempts to amend their conditions of work his efforts were crowned with success. The medical officer of his infirmary was allowed as a tentative experiment (*a*) to compete for appointment upon the staff of the local county hospital (and in this he has been successful), (*b*) to use certain hours for private

practice. The result has been so to enhance the efficiency and status of the infirmary that a growing number of patients ask to be sent there rather than to the voluntary hospital, and this is not because they have to, or wish to, pay less for their treatment, but because they know that they will not only receive treatment just as good, but also be charged a fair and reasonable weekly amount assessed in a business-like way upon their income. Of course, I am aware that all this is quite illegal (for they are not indigent persons), but it has to be done where long waiting lists and shortage of accommodation at the voluntary hospitals make any port in a storm necessary. Coöperation on terms of equality between rate-aided and voluntary hospitals would solve the problem of waiting lists and shortage of hospital accommodation.

The problem concerns general practitioners very deeply, for we are often hard put to it to find nursing accommodation and specialist treatment for the majority of our middle and lower middle-class people. Paupers and capitalists alone can command these services when needed. There is in fact an urgent and growing need and demand for private wards and clinics for those who can and will pay in proportion to their income. Insuperable difficulties seem to have hitherto precluded the voluntary hospitals from catering for such patients, though many of them are now trying the experiment. Our infirmaries will perhaps sooner be able to provide this accommodation and specialist treatment than our voluntary hospitals. A rate-aided specialist service is already an established fact at the local infirmary to which I have referred, and the British Medical Association has approved of the scale of fees for specialist services agreed upon. What has been arranged for paupers can surely be arranged for ratepayers. The clerk to the guardians to whose foresight and initiative these advances are due has, moreover, got out plans for private wards at the local infirmary; the erection of a nurses' home will set free for this purpose several wards in the main building now occupied by nurses.

But the most important point of all in counteracting professional degradation is a change in the attitude of the guardians towards their medical officers. The present policy of the guardians is to pick out the most promising of their medical officers for "promotion" and forthwith subordinate their professional skill, experience, and knowledge to administrative duties. As medical superintendents they become loaded with administrative work which a trained business man could perform much better. But the climax of this policy is reached when the pick of them all is appointed chief medical officer and forthwith is submerged in a purely administrative post.—I am, Sir, yours faithfully,

Brighton, August 25th, 1927. HENRY J. BAILEY.

THE SMOKING HABIT AND MENTAL EFFICIENCY.

To the Editor of THE LANCET.

SIR,—I have had an opportunity to make a new study of the smokers and non-smokers at Antioch College this year as a control to the study which I made in 1925, the results of which appeared in THE LANCET of May 22nd, 1926. This year the College provided me with a somewhat larger sample: 231 non-smokers and 215 smokers. The superiority of the non-smokers in scholarship is as clear as it was in the previous sample. However, the evidence which appeared two years ago tending to incriminate smoking as a *cause* of poorer scholarship is missing this year. No decline in scholarship is evidenced by 89 smokers who have been with us for the past three years. There is no significant difference between the scholarship of smokers who inhale and those who do not, nor between those who smoke much and those who smoke little. It is true that during the year we have dismissed because of low scholarship 10·5 per cent. of our heavy smokers, 6·7 per cent. of lighter smokers, and only 2·5 per cent. of our non-smokers, and, since the grades of students who have been dismissed are necessarily excluded from our study, the remaining heavy smokers gain from these dismissals. Nevertheless, I feel that the results this year definitely weaken the case against tobacco as a cause of mental inefficiency.

May I repeat, to avoid misunderstanding, that there is no possible doubt of the association between low scholarship and the smoking habit, whatever the explanation may be?

I am, Sir, yours faithfully,

J. ROSSLYN EARP.

Antioch College, Yellow Springs, Ohio, August 17th, 1927.

CERTIFICATION OF THE INSANE.

To the Editor of THE LANCET.

SIR,—That this subject is one demanding the serious consideration of the profession, and apparently getting it, is proved by the important leading article in your issue of July 31st, and by your reports in the same issue and the subsequent one of recent discussions in Edinburgh. Unfortunately, no conclusions were reached at either of these discussions, for the speakers failed to agree on and recommend any one policy. This unsatisfactory state of affairs will, I fear, only defer the passing of any legislation, since until the profession knows its own mind the Legislature is not likely to move in the matter at all. The trend of opinion is, however, towards securing early treatment for insanity, and reducing to a minimum the legal enactments that only delay this early treatment. It is true that in Scotland such are less evident than they are in England, and yet Prof. Robertson maintains that no records of illegal detention exist there for the past 70 years; and we know that the evidence submitted to the recent Lunacy Commission satisfied them that it was practically unknown in English asylums. Therefore, if it is loss of liberty alone that concerns the legal world in this question the lawyers need no longer concern themselves with it, for in the treatment of this disease, in the large proportion of cases, "loss of liberty" is absolutely necessary, just as much as it is—temporarily, it is true—in the cases of administering an anæsthetic or extracting a tooth.

Again, under the present state of affairs, I am at a loss to see why it is the doctor, and not the magistrate, who is prosecuted in many cases; all the doctor does is to issue a medical certificate, the magistrate it is who signs an order for the patient's detention, and it is this order, not the doctor's certificate, that legalises the lunatic's detention. Some magistrates are so conscientious in the discharge of their duties that they refuse to sign any order unless, and until, they hold a court, *de lunatico inquirendo*, on their own, summon witnesses, take evidence upon oath, and generally delay the treatment of the patient, besides running up big legal charges. On the other hand, there are magistrates who, satisfied with the bona fides of the certifying practitioner, issue the necessary order without ever seeing the patient at all or taking any evidence.

It is thus seen how absurd is the calling in of the aid of the law before a medical man can satisfactorily treat this sad disease; and the cure is simple—divorce law from medicine altogether. It is true the lawyers would naturally object to any such plan, on the grounds that their relation has existed from times immemorial, but they have had their fling and it is now the doctors' turn. This divorce is the ideal at which we should aim, and if the B.M.A. make it their policy we should see a better state of affairs in this country than even exists in Scotland. All the legal elements that at present entangle the satisfactory treatment of insanity, and that select this only disease as the one to be "legalised," should be eliminated altogether—a medical certificate, and the consent of the Board of Control, being sufficient to empower the keeper of an asylum hospital to detain the person referred to "for care and treatment" until he is recovered, or

until the Board of Control makes other arrangements for his care.

It will be noted that I still consider the doctor's certificate an important document, and on it legal proceedings may be taken—no medical man can escape this risk. But I would suggest that such risks should be left open, as they are in other cases of carelessness or malpractice in medicine or in surgery. At present insanity is still looked upon almost as a crime, and it is because of this interference by the law in its treatment that the public cannot get over the feelings of shame and disgrace associated with this disease in any member of their family. To change the name of the disease, or the place of detention, is not going to reduce this disgrace—it is merely throwing dust in the eyes of the public. Until the profession has finally made up its mind, and our slow-moving legislature has evolved legislation—if such were still necessary—to simplify the treatment of the insane, the doctor will experience the same difficulties as have surrounded him in the past, and it will be a very serious matter if, as has been reported, a clause is being inserted in many partnership agreements prohibiting the certifying of lunatics. No general practitioner should certify an alleged lunatic unless he is prepared to state that the patient "is dangerous to himself or others." Unless this is so the patient cannot *legally* be declared of unsound mind, and unless a medical man can certify to this fact he should, if he would seriously consider his own future personal and financial safety, abstain from certifying. Only thus will he avoid possible litigation until the time comes when insanity is included among other diseases without the odium of legal red tape to hamper its early treatment.—I am, Sir, yours faithfully,

T. DUNCAN GREENLEES.

St. Leonards-on-Sea, August 19th, 1927.

CANCER AND ADRENALIN.

To the Editor of THE LANCET.

SIR,—The effect of adrenalin on transplanted animal tumours, recorded in THE LANCET of August 20th by Drs. T. Lumsden and J. G. Stevens, was described by me 22 years ago,[1] and the process of regression illustrated by two drawings. In my experiments the adrenalin was injected at a site remote from the tumour and not around the tumour, as in Lumsden's experiments, since a therapeutic agent which will act only on local application to a growth is obviously of little practical value. Subsequently Reicher[2] has reported the regression of transplanted tumours in rats and mice after the injection of adrenalin into the tissues surrounding the growth.

I am, Sir, yours faithfully,

W. CRAMER.

Imperial Cancer Research Fund, August 19th, 1927.

THE LABELLING OF EGGS.

To the Editor of THE LANCET.

SIR,—I was particularly interested in the communication from Dr. A. G. Everard, who apparently is a home egg producer of the better sort. I can assure him that medical officers of health generally would be only too pleased to carry out more active supervision of the eggs as supplied to the English consumer if the matter was not hedged about with so many difficulties. What is required, in my opinion, is a very simple legal enactment indeed, without any loopholes in the matter, but I fear this is too Utopian at the present time whilst there are such facilities for a certain class of English egg producers to fortify their home production by means of the imported variety.

I am, Sir, yours faithfully,

E. G. ANNIS,

August 19th, 1927. Medical Officer of Health, Greenwich.

[1] Second Scientific Report of the Imperial Cancer Research Fund, 1905, p. 60.

[2] Deutsche Med. Wochenschrift, 1910, p. 1356.

ASTHMA AND ARTHRITIS IN ALTERNATION.

To the Editor of THE LANCET.

SIR,—It is a common observation that asthmatic symptoms, in some patients, disappear during an intercurrent infection. This is the basis for the "protein shock" treatment of asthma. It would not therefore be surprising if asthmatic symptoms disappeared during the subacute phase of an infective arthritis. The course of many cases of rheumatoid arthritis is not steadily progressive; remissions occur, during which joint swellings, with pain and tenderness, subside. It cannot therefore be unexpected that when rheumatoid arthritis occurs in an asthmatic the symptoms of these two maladies may alternate. Dr. Harold O. Long reports in your issue of August 20th a case of alternating rheumatoid arthritis and asthma, and says he is on the track of an intestinal organism which he hopes is the cause of both conditions, and that a course of autogenous vaccines from this source will arrest both conditions. The ætiology of the two disorders may be analogous. Asthma is generally recognised to be an allergic manifestation. I believe there is evidence that in rheumatoid arthritis the affected joints are sensitised to streptococci, and that the morbid process in the early stages of this condition is one of "reactions" in such sensitive joints. But from the mere coexistence of asthma and arthritis one surely cannot conclude that the two maladies have the same essential cause.—I am, Sir, yours faithfully,

Harley-street, W., August 22nd. KENNETH STONE.

MEDICAL SCIENCE IN THE CITY OF YORK.—In a communication from Dr. G. A. Auden concerning the association of the City of York with the history of medicine, which appeared in THE LANCET of August 6th, "David de Bres" should read "David de Brus"—otherwise David Bruce, King of Scotland. Dr. Auden informs us that the earliest entry of a freeman barber-surgeon in the Roll of Freemen is under the date 1299, and that this entry is followed by several hundred names of physicians, apothecaries, surgeons, and barber-surgeons who received their freedom down to the latter half of the 18th century, when the list published by the Surtees Society was brought to an end.—ED. L.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—Dr. Reginald W. Statham has been elected Master of this Society.

At recent examinations the following candidates were successful in the undermentioned subjects:—

Surgery.—G. C. Rhys-Jones and E. H. Waller, Charing Cross Hosp.; and J. L. M. Wood, Sheffield.

Medicine.—L. J. Lawrie, London Hosp.; B. Rosenzvit, Middlesex Hosp.; S. B. S. Smith, St. Bart.'s Hosp.; and V. R. Smith, Manchester.

Forensic Medicine.—K. E. Clark, Charing Cross Hosp.; W. H. Collins, London Hosp.; F. W. Crossley-Holland, St. Bart.'s Hosp.; T. C. Lansdale, Guy's Hosp.; J. Miller, St. Bart.'s Hosp.; and V. R. Smith, Manchester.

Midwifery.—L. Ashkenza, Middlesex Hosp.; T. M. Beattie, Leeds; A. F. J. D'Arcy, St. Mary's Hosp.; J. Miller, St. Bart.'s Hosp.; N. S. J. Roberts, Bristol and Royal Free Hosp.; and J. L. M. Wood, Sheffield.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery: L. Ashkenza, T. M. Beattie, W. H. Collins, T. C. Lansdale, L. J. Lawrie, S. B. S. Smith, and E. H. Waller.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Sept. 5th, to SATURDAY, Sept. 10th.—QUEEN MARY'S HOSPITAL for the East End, Stratford, E. Post-graduate course in Medicine, Surgery, and the Specialties. Lectures and clinical demonstrations daily in all departments.—BETHLEM ROYAL HOSPITAL, St. George's Fields, S.E. Lecture-demonstrations in Psychological Medicine on Tuesday and Saturday, at 11 A.M.—Further information from the Secretary.

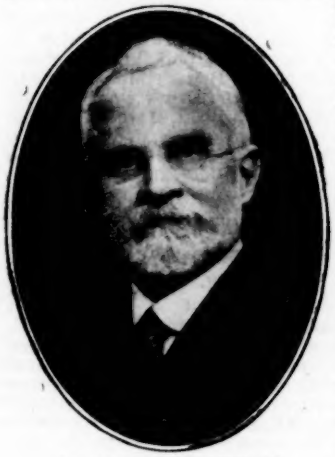
Obituary.

ALBAN HENRY GRIFFITHS DORAN, F.R.C.S. ENG.,

CONSULTING SURGEON TO THE SAMARITAN HOSPITAL.

As we announced briefly in the Students' Number last week Mr. Alban Doran, the well-known anatomist and gynæcologist, died on Tuesday, August 23rd, in St. Bartholomew's Hospital.

Alban Henry Griffiths Doran was the only son of John Doran, an Irishman, who came to London in consequence of political troubles at the beginning of the nineteenth century. John Doran was a well-known littérateur, classical scholar, and antiquary, and was for a brief time editor of the *Athenæum*, but is best known for his association with *Notes and Queries*, which he conducted with conspicuous success for many years. Alban Henry Griffiths Doran, his only son by Emma, daughter of Captain Gilbert, R.N., was influenced throughout his life by his father's love of letters, from whom he inherited the skill and grace which were the features of his considerable literary output, as well as untiring industry in research.



ALBAN DORAN, F.R.C.S.

Doran was born in 1849 in Pembroke-square, Kensington, and received his preliminary education at a school in Barnes, entering the Medical School of St. Bartholomew's Hospital in his eighteenth year. He was a distinguished student, winning prizes with annual regularity, and on qualification as M.R.C.S., L.S.A., obtained the resident posts and was afterwards appointed demonstrator of anatomy in the medical school. A year later he was appointed by the Royal College of Surgeons of England anatomical assistant, his chief being Sir William Flower, who was Curator of the College Museum from 1861 until he succeeded Owen in 1884 as Director of the Natural History Museum. Flower, both as Curator and later, in succession to Huxley as Hunterian Professor at the College, contributed greatly to the arranging and extension of the splendid anatomical preparations, and found in Doran an invaluable lieutenant. The collecting and setting in order of the materials required for display led to the institution of a catalogue of the pathological specimens in the Museum, and in the compilation of this catalogue Doran worked indefatigably with Sir James Paget and Sir James Goodhart.

Doran looked back on his youthful period in the Museum with great pleasure for it was then that he made an intensive study of the ear bones of mammals, assembling and cataloguing for the College a collection which is still regarded as a standard. The results of his inquiry into the anatomy and evolution of the auditory ossicles formed an elaborate monograph which was published in the *Transactions* of the Linnean Society, and in the evening of his life nothing pleased him so much as a reference by a present-day authority to his early monograph. Even as he lay on what proved to be his death-bed his interest was at once aroused when a friend mentioned to him that the accuracy of his description of the ear bones of the golden mole had been highly commended in a monograph just communicated to the Royal Society and thereafter he relapsed into the lament that there were two important gaps in his collection of auditory ossicles in the Museum of the College he had never succeeded in filling up. Such an instance is characteristic of Doran's attitude to the world; it was knowledge, not money, he thought of.

In 1875, while employed in the Museum, Doran took the Fellowship of the College, and shortly afterwards was elected assistant surgeon to the Samaritan Free Hospital. Here he came under the direct influence of Spencer Wells, who perhaps more than any one man can be called the originator of modern abdominal surgery. Wells was then at the top of his fame, having justified 20 years of assiduous work in perfecting his technique of ovariotomy, which operation was largely discredited by the medical profession when his enthusiasm and scientific skill re-established it as a life-saving procedure. It was no easy task to assist Spencer Wells, who was an extraordinarily careful operator and had progressed very far in operative success before the spread of Listerian doctrines made his technique, as applied to ovariotomy, the routine procedure over the whole field of abdominal surgery. Doran became well known in this department of surgery, and was attached to the Samaritan Hospital for over 30 years, and established there his claim to being a fine operator and an individual thinker. He never enjoyed a large practice, but he was always accepted, and rightly so, by the medical profession as a leading authority on his subject. He was an honorary Fellow of many European and American obstetrical and gynæcological societies, and was elected President of the Obstetrical Society of London in 1899.

Doran was not a voluminous author along professional lines. Apart from the note on the morphology of the ossicula auditûs, his only considerable contribution to medical literature was the "Handbook of Gynæcological Operations," which was published as far back as 1887. This work hardly obtained the reception which it deserved, and this may have been due to the difficulty in which reviewers were placed through its appearance at a time when there was a feeling that oöphorectomy was being performed with too great frequency, or at any rate that many of the questions in connexion with that operation, and with supravaginal hysterectomy, were the subject of discussion. Bantock, Wells, Knowsley Thornton, Keith in Edinburgh, and Lawson Tait had met with remarkable success here, but their followers, unaided by a proper understanding of antiseptics and without the individual skill of their masters, had brought operative gynæcology into some disrepute. Doran's book took no side in questions which were being anxiously asked. But it treated the surgical anatomy of the female organs with great care, and it is interesting to note, in view of the latest activity of the author's life, that several chapters were devoted to an account of instruments and appliances and their right use. Other sections summed up pathological appearances, explaining their significance and influence on diagnosis in the clear way that might have been expected from one who was a frequent speaker in the debates of the Pathological Society. The whole range of operative gynæcology was covered by accurate descriptions of the various procedures, and Doran was early in his distinct pronouncement that ovariotomy should be performed immediately the tumour is diagnosed, a view which few but Spencer Wells and his immediate disciples would have taken some years previously, but which had become tenable in consequence of the great reduction in mortality occurring after abdominal operations brought about by the discoveries and teachings of Lister. He was the first editor of the *Journal of Obstetrics and Gynæcology of the British Empire*, and his conduct of the enterprise during its first two years of life laid the foundation of after success.

Outside medicine Doran's pen was especially employed in the study of Shakespeare, and when he delivered the Annual Oration before the Medical

Society of London in 1889, he took Shakespeare as his subject. He was also interested in certain by-paths in English and French history, and it may be noted that his father had not only resided for many years on the Continent but was detained in France for three years as a prisoner during the Napoleonic wars.

Doran retired from practice about 18 years ago, and at once engaged in work in the Hunterian Museum. His first voluntary task was the revision of the extensive series of gynæcological specimens, for which he prepared a new descriptive catalogue—one which has been of the greatest use to all who consult this part of the Museum. His second task was the preparation of a descriptive catalogue of the great collection of obstetrical instruments presented to the College by the old Obstetrical Society upon its amalgamation with the Royal Society of Medicine. This undertaking involved Doran in a laborious and prolonged historical inquiry into the evolution of obstetrical instruments, and nowhere is his accuracy and breadth of scholarship so apparent as in this catalogue—in reality a text-book of reference. Having finished this task, he then proceeded to prepare a new catalogue—one for which there was great need—of the great collection of surgical instruments and appliances preserved in the Museum of the Royal College of Surgeons. Day after day he toiled at this task, which in the form of eight typewritten volumes was completed only two years ago. No one can write on the history of surgical instruments with profit without consulting this work, and it is to be hoped that means will yet be found for its publication. Eyesight and strength began to fail just as Doran brought this bold undertaking to an end, although latterly he was able to pay occasional visits to the Museum in order to catalogue additional gifts that had come in. It is pleasant to know that the work is being continued by Doran's friend, Mr. C. J. S. Thompson.

Alban Doran never married. After his father's death he lived for many years with his widowed mother in Granville-place, but since his retirement from practice, brought about by eye trouble, he had occupied a flat in West Kensington where he was for a long period under the care of Dr. Rickard Lloyd, who has sent us the following note: "In his declining years he used to discuss his growing afflictions with such courage and patience that he seemed to be considering the age, symptoms, and ailments of someone other than himself. While sight allowed he was a constant reader of current literature, although his especial interest was in medical news. Full of information, it was a great pleasure to hear him narrating his reminiscences of old friends and associations, and always showing notable affection for his old medical school and 'the College.'"

WILLIAM DIXON JEFFERSON, M.R.C.S. ENG., L.R.C.P. EDIN.

THE death of Dr. W. D. Jefferson took place at Ripon on August 22nd after an illness lasting some weeks. Born at Northallerton in 1855, he was the son of Mr. W. T. Jefferson, a solicitor, and went to Giggleswick School and later to King's College, London. He qualified as M.R.C.S. Eng. at the age of 22 and immediately settled at Ripon, taking over the practice of the late Dr. Frankland. For the last 50 years he had practised in the neighbourhood, holding the appointment of medical officer of health of the borough, besides being surgeon to the Ripon Cottage Hospital and medical officer to the first district of the Ripon Poor-law Union. This last post he resigned about a fortnight before his death. Dr. Jefferson was made an honorary associate of the Order of St. John of Jerusalem in recognition of his services in giving ambulance training to railway employees. He married in 1891 the daughter of the Rev. W. Gray, Vicar of Sharow. One of his two sons, Lieutenant Ingleby Jefferson, lost his life in the submarine service during the late war. The other holds a commission in the Welsh Guards.

ARTHUR DRURY, M.B. EDIN.

To the profession at large Dr. Arthur Drury, who died on August 22nd, at Halifax, was best known for his work as hon. secretary of the Jenner Society, as a president of the Association of Public Vaccinators of England and Wales, and as editor of the Jennerian supplement of the *Medical Officer*. Primarily, however, he was a Halifax practitioner, and nearly all his life was spent in his native town. As a boy he was a pupil at the Making Place School, Soyland, and though he continued his education at Edinburgh, where he took the first prize in mental diseases of the Royal College of Surgeons, he returned to Halifax soon after graduating in medicine in 1887, and took up practice in the neighbourhood. He was appointed medical officer of the Halifax Poor-law Union and public vaccinator for the borough, and in this last work found much to interest him, so that he became a keen advocate of vaccination, as well as an authority on its technique. This did not prevent him, however, from devoting time and thought to other medical problems, and apart from office in vaccinist organisations he was at one time chairman of the Halifax division of the British Medical Association. During the late war Dr. Drury was attached to St. Luke's War Memorial Hospital, Halifax, holding the rank of major in the Royal Army Medical Corps, and for some years he acted as medical adviser to the Halifax Rugby League. He was 65 years of age, and he leaves a widow, a son, and a daughter.

THOMAS PORTER GREENWOOD, M.R.C.S. ENG., L.R.C.P. EDIN.

Dr. T. P. Greenwood, who died on August 15th whilst leaving his house in answer to an urgent call, had for many years enjoyed a large operating practice in South Lincolnshire and Rutland, and was medical officer of health to the rural districts surrounding the town of Stamford. Educated at University College, London, he qualified M.R.C.S. Eng. in 1875, and after a period as house surgeon to the Derbyshire General Infirmary went to Stamford Infirmary in the same capacity. He became assistant partner and successor of the late Dr. Row, and joined the surgical staff of several local hospitals, including the Stamford Infirmary and Browne's Hospital. Soon after settling in the district Dr. Greenwood was appointed medical officer of health, and he did excellent work in connexion with housing, scavenging, and the provision of hospital accommodation not only for Stamford but for the county of Rutland. He promoted the building of a small-pox hospital and of a maternity and children's ward at the Stamford Infirmary, and during the Rutland epidemic of poliomyelitis he placed a ward at the disposal of the authorities and was, as in other emergencies, unsparing of his time and labour.

"In the course of a long and successful career," writes a colleague, "Greenwood acquired all that should accompany old age—honour, troops of friends, and the gratitude of innumerable patients whose lives he had saved or prolonged, or whose sufferings he had alleviated. But at three score years and ten he still preserved a keen interest in all medical matters. He was always eager to learn; new methods were carefully studied and easily acquired. As he was qualified as far back as 1875, it is doubtful if he could have seen much nose and throat work in his student days, but being keenly interested in this branch of work he became surgeon to the education authorities of the surrounding counties, and was almost invariably successful in the modern operation for the enucleation of tonsils and the removal of adenoids..... Indeed, his ready sympathy with the aspirations of modern public health work was one of his most remarkable traits. It has been said that no great man is a hero to his valet, but Dr. Greenwood was certainly one to his assistants. One of his old assistants advised his partner, who was migrating to Rutland, 'to call in

Greenwood when in difficulties, the best general practitioner in the Midlands.' What greater praise could a man desire ? "

In 1903 and again in 1925 Dr. Greenwood was president of the Midland Branch of the British Medical Association. He died in his seventy-fourth year, and leaves a widow and three daughters.

OLIVIER POLHILL TURNER, M.R.C.S. ENG., D.P.H.

GREAT regret is felt in Hastings at the death of Dr. O. P. Turner, deputy medical officer for the town, which occurred on August 19th. He had been in poor health for some time, but his death seems to have been hastened by going to help in the resuscitation of two people who had been rescued from the sea after a bathing accident. Dr. Turner was a Londoner and studied medicine at University College. He qualified in 1902, and after a house appointment at Brighton went to Hastings some 20 years ago as school medical officer. Always a busy man, he was a prolific writer, and contributed a number of articles and letters to medical journals. During the late war he held a commission as surgeon in the Royal Air Force, and acted as medical officer in the pathological department of the Addington-park War Hospital, Croydon. He was a genial and generous man, and his somewhat reserved manner did not prevent him from quickly making friends of those with whom he came in contact. He leaves a widow and two sons.

PHILIP FOSTER, M.D. ST. AND., M.R.C.S. ENG.

Dr. Philip Foster, who has died at Leeds at the age of 88, was the son of Dr. Edwin Foster, who practised in the town for many years. He was educated at Leeds Grammar School and the Leeds School of Medicine, and graduated as a doctor of medicine at St. Andrew's University when he was only 22, being the youngest holder of the degree at that time. With his brother, Dr. A. C. Foster, who survives him, he had lived for many years in close retirement at the house in Park-place which their father had occupied before them. Dr. Foster's interest in medical and surgical science was considerable, and he published a number of works on alcohol, the maintenance of health, and similar topics. What brought him most to the notice of the profession in general was his report[1] of a case of Cæsarean section in 1872. According to his account the operation had only proved successful in six cases previously in this country, though it had been performed more than 60 times. Dr. Foster's comment on this state of affairs was as follows: "Although the results of operative procedure are thus shown to be so terribly unfavourable, still to leave the patient to nature, delivery being impossible through the natural passages, is to leave her to die. There is no evading, therefore, the responsibility of the operation; and, if but one case in a thousand were successful, it would still be an imperative duty to urge and to undertake it. I feel that the importance of *operating early* cannot be too strongly insisted upon."

Dr. Philip Foster was a reader and writer of catholic taste and sound judgment. He was especially well versed in the literature of Shakespeare, and some years ago wrote a series of 40 anniversary articles on Shakespeare in a Yorkshire newspaper. Starting practice in the days when a doctor made his rounds on horseback, he retained all his life a love of horses, breeding his own mounts both for professional work and hunting. He took a keen interest in racing, and is said to have seen the St. Leger run 65 times. His father, Dr. Edwin Foster, made a rule of never sending out a bill for medical services, and his sons, we are informed, have generally followed this example.

[1] THE LANCET, 1872, i., 753.

FRANCIS BARTON, M.R.C.S., L.R.C.P.

THE death took place on August 14th, at Liverpool, of Dr. Francis Barton, who had been in practice for many years on Merseyside. He was a native of Woolwich, and was the fourth son of the late Colonel W. Barton, R.A. He came to Liverpool from the Channel Islands and received his medical education at University College, Liverpool, qualifying as M.R.C.S. Eng. in 1903. He began practice in Wallasey, but about 20 years ago he transferred to the Prince's-park district of Liverpool. He held several medical appointments, including that of medical officer of the Mersey Docks and Harbour Board, the Mercantile Marine Association, and the Rechabites. He was an active member of the Wesleyan community in Liverpool, a prominent Freemason, and a founder of the Liscard Temperance Lodge. He devoted a large part of his time to philanthropic work among the poor in the neighbourhood of Mill-street. Dr. Barton's wife died only a few months ago.

Appointments.

DUHIG, D. J., L.R.C.P. Edin., L.R.C.S. Edin., L.R.F.P.S. Glasg., has been appointed Honorary Assistant Surgeon to the Nose, Throat, and Ear Department, Dewsbury Infirmary.

Surgeons under the Factory and Workshop Acts: SIMPSON, C. B., M.R.C.S., L.R.C.P. Lond., for the Filey District, York, East Riding; WOOLLCOMBE, A., for the Okehampton District, Devon.

Medical Referee under the Workmen's Compensation Act: CAHILL, Lieut.-Colonel R. J., D.S.O., M.B., B.Ch., of Chester, to be an additional Medical Referee for the districts of the Chester and Nantwich and Crewe County Courts (Circuit No. 7).

Vacancies.

For further information refer to the advertisement columns.

Albert Dock Hospital, Connaught-road, E.—H.S.'s. At rate of £110.

Ayr County Hospital.—Sen. H.S. and Jun. H.S. At rate of £100 and £80 respectively.

Bath, Royal United Hospital.—H.P. and Asst. H.S. At rate of £120 and £100 respectively.

Birmingham City.—M.O.H. £1800.

Birmingham and Midland Eye Hospital.—Jun. H.S. £110.

Bristol Royal Infirmary.—Sen. Res. M.O. £200.

Cardiff City Mental Hospital, Whitchurch, nr. Cardiff.—Sen. Asst. M.O. £550.

Derbyshire Education Committee.—Asst. Sch. M.O. £600.

Devonport, Royal Albert Hospital and Eye Infirmary.—Asst. H.S. Also H.S. £150.

Dreadnought Hospital, Greenwich.—H.P. and H.S. Each at rate of £110.

Hastings County Borough.—Asst. M.O.H. and Asst. Sch. M.O. £600.

Hospital for Tropical Diseases, Endsleigh-gardens, N.W.—H.P. At rate of £110.

Hospital of St. John and St. Elizabeth, 40, Grove End-road, N.W. Res. H.P. At rate of £100.

Ipswich, East Suffolk and Ipswich Hospital.—Two H.S.'s and one H.P. Each at rate of £100.

Leeds Public Dispensary.—Hon. Dental Surg.

Leicester Royal Infirmary.—H.P. and H.S. Each at rate of £125.

Lister Institute of Preventive Medicine, S.W.—Research Fellowship in Bacteriology. £500.

London Hospital, E.—Surg. and Phys.

London Lock Hospital, 91, Dean-street, W.—H.S. At rate of £200. Also Surg. Reg. £100.

London Lock Hospital, Harrow-road, W.—H.S. At rate of £150.

Lord Mayor Treloar Cripples' Hospital, Alton and Hayling Island, Hants.—Asst. Res. M.O. £300.

Manchester, Ancoats Hospital.—H.S. At rate of £100.

Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Res. M.O. At rate of £125. Also Jun. Res. M.O. At rate of £50.

Manchester Ear Hospital, Grosvenor-square, All Saints.—Non-Res. H.S. At rate of £150.

Manchester, Royal Children's Hospital, Pendlebury.—Res. Med. and Surg. O.'s. At rate of £125. Also O.-P. Dept., Gartside-street, Two Asst. M.O.'s. Each at rate of £150.

Manchester, St. Mary's Hospital, Whitworth-street.—Two H.S.'s. Each at rate of £50.

National Hospital for Dis. of Heart, Westmoreland-street, W.—Res. M.O. At rate of £150. Also Out-patient M.O. At rate of £125.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—Res. M.O. £300.

Northampton General Hospital.—Two H.S.'s. Each at rate of £150.

Nottingham General Dispensary.—Res. Surg. £250.

Preston and County of Lancaster Royal Infirmary.—H.P. £190.

Queen's Hospital for Children, Hackney-road, E.—H.S. At rate of £100.

Royal National Orthopædic Hospital, 234, Great Portland-street, W.—H.S. At rate of £150.

St. Peter's Hospital for Stone, &c., Henrietta-street, W.C.—H.S. At rate of £75.

Salisbury General Infirmary.—H.S. £150.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—Anæsthetist. £30.
Sheffield Royal Hospital.—Res. Anæsthetist. At rate of £80.
Tunbridge Wells Eye and Ear Hospital.—H.S. £150.
Warrington Infirmary and Dispensary.—Sen. H. S. £250.
West London Hospital, Hammersmith-road, W.—H.P. and two H.S.'s. Each at rate of £100.
Westminster Hospital Medical School.—University Readership in Pathology. £800.
Whipp's Cross Hospital, Whipp's Cross-road, Leytonstone, E.—Res. Asst. M.O. £400.
Willesden General Hospital, Harlesden-road, N.W.—O.-P. Clin. Asst.
Williton Rural District, Somerset.—M.O.H. £110.
Wolverhampton and Midland Counties Eye Infirmary.—H.S. £200.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Stamford (Lincs.) and Llanelly (Carmarthen).

The Secretary of State for the Home Department gives notice that, in consequence of the death of Mr. W. J. Greer, L.R.C.P., F.R.C.S., one of the medical referees under the Workmen's Compensation Act, 1925, for the districts of the Chepstow, Newport, and Pontypool County Courts (Circuit No. 24), the appointment held by him is vacant. Applications (*from surgeons*) for the post should be addressed to the Private Secretary, Home Office, Whitehall, London, S.W. 1, and should reach him not later than Sept. 17th, 1927.

Births, Marriages, and Deaths.

BIRTHS.

BURNELL.—On August 17th, at Lemon-street, Truro, the wife of G. F. Burnell, M.R.C.S. Eng., L.R.C.P. Lond., of a daughter.

NUNAN.—On August 21st, at Nairobi, the wife of Patrick Nunan, M.D., of a son.

WALKER.—On August 22nd, at Elgin-avenue, London, W., the wife of William Wood Walker, M.B., Ch.B. Aberd., of a daughter.

MARRIAGES.

FORBES—PENNY SNOOK.—On August 17th, at Holy Trinity Church, Weymouth, Dr. Colin Macphail Forbes to Helen Edith Mary Penny Snook, youngest daughter of Dr. and Mrs. Penny Snook, of Netherton House, Weymouth.

DEATHS.

BRADY.—On August 25th, of peritonitis, at Sydney, N.S.W., Andrew John Brady, L.R.C.S.Irel., L.R.C.P. Irel., and L.M.

CAMPION.—On August 23rd, at Cairo, Egypt, suddenly, from heart failure, Oliver St. Leger Campion, M.R.C.S. Eng., L.R.C.P. Lond., late Captain R.A.M.C., and Flight-Lieut. R.A.F., aged 35.

DORAN.—On August 23rd, Alban H. G. Doran, F.R.C.S. Eng., of Lisgar-terrace, W., aged 78.

DRURY.—On August 22nd, at Landon House, Halifax, Arthur Drury, M.B., C.M. Edin., aged 65 years.

GIBBES.—On August 25th, Cuthbert Chapman Gibbes, M.D. Aberd., C.M., M.R.C.P. Lond., D.P.H. Camb., of Oxford and Cambridge Mansions and Harley-street, aged 76.

HAWES.—On August 20th, at Abingdon-court, W., Francis B. Hawes, L.R.C.P. & S. Irel., aged 69.

JEFFERSON.—On August 22nd, at North House Ripon, William D. Jefferson, M.R.C.S. Eng., L.R.C.P. Edin.

LOW.—On August 29th, John Spencer Low, C.B.E., M.B., Ch.B., B.Sc. Edin., D.P.H. Lond., Barrister-at-law.

MCLACHLAN.—On August 21st, at Abbotsford-park, Edinburgh, John M. McLachlan, L.R.C.P. & S. Edin., L.R.F.P.S. Glasg., late of Burbage, Leicestershire, in his 40th year.

PARSONS.—On August 21st, John E. H. Parsons, M.B.E., M.R.C.S., L.R.C.P. Lond., of Theobald House, Rochester.

TURNER.—On August 19th, of angina pectoris, at Marina, St. Leonards-on-Sea, Olivier P. Turner, M.R.C.S. Eng., L.R.C.P. Lond., D.P.H. Oxf., Deputy Medical Officer of Health for the County Borough of Hastings, aged 57.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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Notes, Comments, and Abstracts.

THE MEDICAL AFFINITIES OF G. P. R. JAMES.[1]

Mr. S. M. Ellis, who is well known for his writings on Victorian writers, has followed up his study of Harrison Ainsworth, G. P. R. James's contemporary and literary rival, by a study of James himself. We confess that the impression made upon ourselves by Mr. Ellis's account is that James was as mediocre as his books. By heredity he should have been something more, for his grandfather was Dr. Robert James, the friend of Johnson, Garrick, Boswell, and Goldsmith, and the self-claimed inventor of the well-known James's powders. As to the real composition of this preparation there is much diversity of opinion, but antimony was the chief ingredient, and antimonial powders were no new thing in James's time, for so far back as 1587 the Honourable Robert Dudley had invented the Pulvis Cornachinus, a mixture of diagridium, tartar, and diaphoretic antimony with cream of tartar. Dr. Robert James left a fortune of £8000 per annum, so in one way or another he was highly successful. He was twice married, and by his second wife had two daughters, one of whom witnessed all the horrors of the French Revolution and had the doubtful honour of being sought in marriage by Robespierre, and three sons, the youngest of whom, Pinkston, was the father of G. P. R. James. Pinkston James in his youth served in the navy, but about 1782 left the service and began to study medicine in Edinburgh. He married in 1791, and for many years practised at 12, George-street, Hanover-square, where the future novelist was born at a date which is variously stated as from 1799 to 1801. He appears to have entered the army, and it is stated that he was sent to Waterloo, but his corps arrived too late to have any share in the actual battle. These things are stated on family evidence, but James could only have been about 15, an age which was low even for a cornet or an ensign. After peace was declared James sojourned on the Continent and developed a considerable linguistic gift, wandering about France, Spain, and Germany. He returned to England about 1825, and in 1828 married Frances Thomas, daughter of Honoratus Leigh Thomas, who was twice President of the Royal College of Surgeons of England, although according to popular repute no great surgeon. After writing an astonishing number of books, making a good deal of money, living in innumerable different districts and houses, losing his money and continuing his hospitalities, James and his family departed for New York, where they arrived in 1850. Here and in Boston he gave lectures, and after a short stay at Stockbridge, in Massachusetts, was appointed British Consul at Norfolk, Virginia, a place of which his son, Charles James, gives a dismal account. The climate, owing to the proximity of the "Dismal Swamp," was unhealthy, malaria and yellow fever abounded, and in 1855 there was a terrible epidemic of the latter, the infection being apparently imported by an American ship. It is intriguing to note that "the pestilence was presaged in Norfolk by a plague of peculiar flying insects, partly yellow in character," but epidemiology as a theme for fiction possessed no attractions for James, though yellow fever in Massachusetts had evoked some 50 years before Brockden Brown's remarkable novel, "Arthur Mervyn." In 1856 the consulate was removed from Norfolk to Richmond, whither James and his family removed, and with the ill-luck which seemed to pursue them, met an epidemic of diphtheria, and James was attacked.

In 1858 James was appointed consul at Venice, and the family left for Europe the same year. Charles Leigh James, who was born in 1846, and had left England for America at the age of 4, has left an interesting account of his impressions of London on his return to England, aged 12. Amongst other things he notes of Regent and Oxford Streets: "Their crossing at the Circus is the most crowded I ever saw anywhere. It is no unusual circumstance to have to wait 15 minutes for a chance to get over on foot." Of James's short, somewhat happy-go-lucky career in Venice, until his death in 1860, Mr. Ellis gives an amusing account, as also of Charles Lever, his brother novelist, who was consul at Spezia.

Despite Mr. Ellis's efforts to establish a claim for James as a good novelist, we cannot go with him. It is true that James's writings have been admired by Thackeray, Stevenson, and Thomas Hardy, but to-day they have lost appeal. Scott, anyone over 50 can still read with pleasure, but how vastly inferior is James's "Forest Days" to Scott's

[1] The Solitary Horseman, or The Life and Adventures of G. P. R. James. By S. M. Ellis. Kensington: The Cayme Press. 1927. Pp. 303. 15s.

"Ivanhoe." We would advise anybody who wishes to enjoy James to-day to read not his own works, but Thackeray's "Barbazure." Incidentally the Thackeray reference to which Mr. Ellis alludes in a footnote on p. 267, and apparently cannot trace, is from "The Rose and the Ring." As an interesting and affectionate account of a writer who in his day gave pleasure to thousands, Mr. Ellis's study is well worth reading.

THE REPORTING OF INQUESTS.

THE rider of the jury at a recent inquest reopens a subject previously dealt with in THE LANCET on more than one occasion, when we expressed the belief that the publication of details was largely responsible for the great increase of suicide from coal-gas. It is, we think, impossible to controvert this belief, and the views then expressed are strengthened by the remarks of the coroner and the jury's rider in the case under discussion. The coroner, however, in telling the jury that the publicity of the coroner's court was one of its greatest assets, and that he had never sat *in camera* to the exclusion of the press, exposed a situation in which publicity is obviously both an asset and a danger. The aim of a coroner's court is to make known the facts concerning a particular death, and for that reason its procedure is less rigid than that of other courts, in which the aim is justice as between one party and another. The public rightly demands that there shall be no secrecy when a fellow citizen has died in circumstances other than those attending ordinary processes of disease or decay; but the satisfaction of this demand surely should be attained without the unfortunate secondary results that so often accompany publicity. Legislation has stopped the publication of detailed divorce reports; they were recognised as appealing to unhealthy sentiments, though the evidence of harm resulting from them was weaker than the evidence of harm from detailed reports of inquests. The news value of inquest reports is not based upon a legitimate demand for the avoidance of secrecy, but upon unhealthy sentiments which are pleasurably stimulated by such reading; and apparently the pleasure does not diminish by the repetition of the stimulus. The results of publishing the letters of suicides are only part of an evil which undoubtedly leads to an increase of suicide. It can be met by a better state of public opinion, and, as suggested by Dr. Waldo, by the good influence and example of newspaper proprietors and editors.

FOLK-MEDICINE OF EXMOOR.

IT is customary to write of primitives as though they existed only in the Australia of Spencer and Gillen, the Brazil of Spix and Martius, or in the South Sea Islands, Greenland, and Central Africa. But as a matter of fact the primitive is in our midst. He abounds even in London suburbs, and is much to the fore wherever a remnant of ancient peasantry lingers unconverted by education, or rather by progress. At the present day Exmoor Forest is still largely a primitive stronghold, and there, more than in any other English countryside, the old folk-medicine of our ancestors lingers among the elderly, however much they may deny the fact. Some half-century ago rational methods and beliefs must indeed have been rare in this isolated region. Charms were universally employed, not only in veterinary cases, where they are to be expected, but where human beings were concerned. Mr. F. J. Snell, in his fascinating "Book of Exmoor" (Methuen and Co., 1903), quotes the following as being still in vogue at the time he wrote. It is a sovran charm to be used in cases of hæmorrhage.

> "Christ was born in Bethlehem,
> Baptised in Jordan.
> The waters, wild and rude,
> The Child, mild and good,
> Put its foot into the flood,
> And bade it turn."

Sciatica was, and indeed is, known by the admirably descriptive term "boneshave," and the charm used to drive it away is heathen in tone: "Boneshave right, boneshave stright, as the water runs by the stave [the line of willows on the bank of a stream], so follow boneshave." The sufferer reclines in a damp situation by a riverside, and the charm is repeated over him by a friend. However, rumour is honest for once, and reports that a certain John Roden died after undergoing the treatment. Another drastic procedure, making for the survival of the robust, is prophylactic, and consists of rubbing a baby all over with snow as soon as snow has fallen after its birth. This preserves against chilblains in later life. A child with a congenital hernia is passed through a cleft tree, a maiden ash that being possessed of peculiarly magical properties. This treatment points back to pre-Christian paganism, even though it be practised at sunrise on a Sunday. Mr. Snell knew a man whose brother had been thus radically cured. To prevent misconceptions the patient was willing to indicate the whereabouts of the tree. A child with whooping-cough was laid on the ground in a sheepfold. Goitre was cured by the touch of a corpse. Sufferers from lues were bidden adopt a signaturist treatment, and to wear the leg of a toad, torn from the live creature, in a bag round their necks. The wearing of a necklace made of borrowed silver coins was held to cure epilepsy in the course of a year. In the case of a girl epileptic a silver ring was substituted for a necklace or bracelet, and this had to be paid for by a tax on bachelors at the rate of a penny a head.

The seventh child of a seventh child was a born curer, and could touch for the King's Evil on Sundays. Such a one was sometimes christened "Doctor" or "Doctress." In a village churchyard near Bridgwater in Somerset there is a tombstone erected to the memory of Doctress Anne Pounsberry, "who departed this life Dec. 11, 1813, aged 73 years." "Stand still," continues her pious epitaph, "and consider the wondrous works of God."

The Evil Eye is known on Exmoor as elsewhere. Indeed, many of these beliefs and practices are universal; they seem to have become concentrated on this wild moorland in an especially well-developed form. It is to be hoped that some future psychologist or anthropologist will be moved to deal with primitive mentality in Western Europe, and especially in Ireland and the Celtic Fringe generally, in the manner of M. Lévy-Bruhl's classical works on the natives of different parts of the world. Such a work, for various reasons, seems still to be hanging fire. We need not go to taboo, mana, orenda, and other supernatural beliefs mentioned by Lévy-Bruhl, when we have their analogues, the "mascot" and "luck," constantly in our midst.

PEPSIN.

A METHOD of isolating the peptic enzyme directly from the gastric mucosa is described by F. Fenger and R. H. Andrew in the June number of the *Journal of Physiological Chemistry*. These workers dissect out the pepsin-producing glandular layers of pigs' stomachs a few minutes after death, clean and trim them in ice-cold water, allowing them to digest with acid water in a cold room overnight, and thus extract from the cells the native insoluble pepsin, partly as activated acid-pepsin and partly, as the hydrogen-ion concentration becomes less, as the enzyme itself. When the pH reaches 3·4 to 3·6 acetone is added in volume about equal to the total water-content. This admixture, while keeping the enzyme in solution, throws out mucin and leaves tissues undissolved. The addition of more acetone—about three times the water-content—very rapidly throws out the crude enzyme freed from more objectionable impurities. This pepsin dissolved in acidulated water may be precipitated by the addition of alkalis, but the authors prefer dialysis which introduces no new substances and reduces the acidity very gradually. At about pH 2·4 precipitation commences, going on until pH 3·85 is reached. From the examination of a series of specimens obtained by fractional dialysis, it is concluded that the purified enzyme is a nearly ash-free protein, quite insoluble in distilled water, but clearly and completely soluble in acidulated water. Its iso-electric zone lies between pH 2·4 and pH 3·85, the most active precipitates being separated at the higher hydrogen-ion concentration. The proteolytic activity of these ranged from 1 : 70,000 to 1 : 45,000 U.S.P. assay. The most active preparations were obtained in the autumn and the least active in spring.

The conclusion that the enzyme is a protein may be sound. It should, however, be pointed out that many other enzymes, assumed to be protein, have on purification ceased to give the characteristic reactions of proteins. Fenger and Andrew's process of cold digestion and extraction and subsequent dialysis doubtless tends to keep out of the preparation many products of hydrolysis which would be found in substantial amounts at higher temperatures.

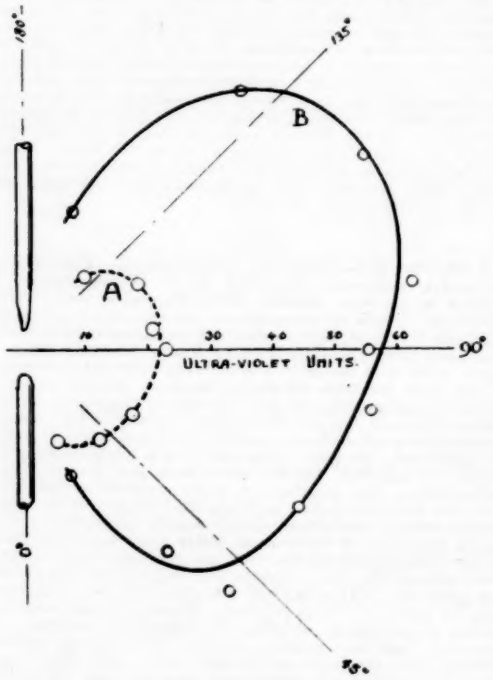
It will be interesting to see whether further work confirms the protein character attributed to the enzyme and justifies the conclusion of J. H. Northrop, which the authors "have found to be the true state of affairs," that "pepsin digestion is a chemical reaction in which the pepsin as well as the protein takes part . . . . the process . . . . is a progressive one in which the enzyme combines with other proteins and gradually loses its identity and physiological characteristics."

THE DESIGN OF THERAPEUTIC ARC LAMPS.

A PAPER by Mr. T. C. Angus, in the August number of the *British Journal of Actinotherapy*, will be read with interest by those who make use of carbon arc lamps for therapeutic purposes. Mr. Angus has made a series of measurements upon the erythema-producing rays emitted from a number of open arcs under various experimental conditions, and the results of these measurements afford valuable data affecting the economic running of these lamps. The rays

were measured by letting them pass into a Griffith & Taylor cadmium photo-electric cell,[1] having first passed through a filter of vitaglass to cut off the short wave-lengths. The ionisation current in the photo-electric cell served as a measure of the erythema-producing rays emitted by the lamp under different working conditions.

The carbon arc has long been used as a source of light, and when used for this purpose the top carbon of an arc is invariably made the positive or anode electrode, because most of the light comes from the crater at the end of the positive carbon. Makers of carbon arcs for therapeutic purposes have followed this example in construction, but Mr. Angus shows that a considerable increase in ultra-violet radiation occurs when the bottom carbon is made the positive electrode. This observation was first made by means of measurements upon the horizontal intensity, but the author has also carried out a long series of tests in other directions, and the main results can be seen from the accompanying diagram taken from his paper. The case illustrated is



that of a D.C. carbon arc, consuming 18·3 amperes at 78 volts. The points are on radial coördinates, and their distance from the arc is proportional to the ultra-violet intensity at their angle from the vertical. The curve marked A corresponds to data obtained with an arc composed of a plain carbon pole as negative electrode at the bottom, and an iron + cerium pole as positive at the top. The curve marked B is with these conditions exactly reversed, the top plain carbon being negative.

The paper contains other data corresponding to various combinations of pole pieces, and they will repay careful study and application by those concerned in the economy of these sources of ultra-violet radiation.

THE PATHOLOGY OF BLUSHING.

BLUSHING, as Darwin wrote, is the most human of all the expressions of human emotion, for in normal people it signifies an awakening of feeling in those regions of the mind which in ordinary superficial social intercourse lie beyond a barrier. There are, however, people who blush on the slightest provocation, and who suffer so much distress from this disability that they urgently demand relief.

In a recent article (August 13th, p. 1003) in the *Presse Médicale*, Dr. P. Hartenberg outlines a theory of the causation of blushing and suggests a remedy. A person becomes an "ereuthophobe," he says, (1) because he blushes excessively, (2) because he is of an anxiety-type. He concludes from his observations of the malady that its organic basis is an abnormal condition of the heart and the vessels, particularly those of the head. The heart is excitable, with an exaggerated impulse but no acceleration of rhythm; the carotid arteries are sensibly dilated and their pulsation is visible as well as palpable. These pulsations extend to the arteries of the head and face. Blushers suffer also from a feeling as of hot gusts in the head and from profuse perspiration; their blood-pressure is apt to be low, and they often have dermatographic skin. They are the victims of a constitutional imbalance between their vaso-constrictor and vaso-dilator systems, the latter predominating. Their blushing is not confined to emotional crises, but follows a heavy meal, a rapid change from cold to warmth, or the act of lying down. It is essentially a physiological ailment, and by no means all blushers are neurotic. Ereuthophobia he describes as the combination of the blush-syndrome with an anxiety neurosis, and the combination is a very formidable one, for the fear makes the blushing worse, and a vicious circle is formed which soon becomes a conditioned reflex. Dr. Hartenberg proposes to treat the physiological blushing, first, by eliminating heavy meals, hot rooms, alcohol, and all other physical causes of vaso-dilatation; and by forbidding all but a minimum intake of fluid until the volume of the blood is reduced. The dilatation itself is counteracted by daily doses of quinine, ergot or adrenalin. For the anxiety state he recommends sedatives and warm baths. He claims that under this régime the abnormal activity of the heart soon abates, with all its symptoms, and that the tendency to blush is brought within reasonable bounds; this has a powerful effect on the patient's psychological state, and, finding that he is no longer blushing as he did, he gains confidence and freedom.

[1] THE LANCET, 1925, ii., 1295.

NATIONAL INSTITUTE FOR THE BLIND.

THE annual report of the National Institute for the Blind, 1926–27 (headquarters, 224–28, Great Portland-street, London, W. 1), is an exhaustive account of the work of the largest institution for the blind and the largest publisher of embossed books in the world. Last year nearly 20,000 bound volumes were issued in Braille type, and the number of pamphlets, magazines, and newspapers exceeded 300,000. In addition, about one-fifth of these numbers were issued in Moon type, a modified Roman type adapted for the use of those who become blind late in life. The books are not all novels, but include educative works of all kinds. The average cost price of a volume is 8*s*., but a discount of two-thirds of the cost price is allowed to all blind purchasers throughout the British Empire, and copies of all publications are presented gratis to the National Library for the Blind for free circulation among blind readers. Taking into consideration these and other concessions, the approximate amount needed to keep the Braille and Moon production up to its present standard is £12,000 per annum. One of the most popular of the periodicals is the *Braille Radio Times*, produced with the coöperation of the B.B.C., who broadcasted an appeal for funds sufficient to enable the Institute to purchase the necessary additional plant. The circulation of this periodical already amounts to 1500 copies, a fact which is some indication of the boon that wireless is proving to the blind. A scheme was initiated by the Institute last year providing for the reconstruction of its council on a more representative basis, and empowering it to open negotiations with local voluntary agencies with a view to framing collecting agreements. This scheme should minimise overlapping in either administrative or collecting activities; arrangements with 37 local agencies have already been concluded, while many more are under consideration.

The Institute's Home Industries Committee is concerned with the welfare of blind home workers in the metropolitan district south of the Thames and in the counties of Kent, Surrey, Sussex, and Hampshire. At present there are 184 blind men and women who come within the scope of this organisation, by which the expense of the middleman in obtaining raw material and marketing the finished goods is eliminated, and the workers are helped in various other ways. Through the Institute's Appointments Board a further number of blind workers have been placed in factories ordinarily employing only sighted labour. About 72 are engaged as telephonists throughout England and Wales, but the majority of the workers trained under the auspices of the Institute are engaged in the profession of massage. Twenty years ago the average wage earned by the blind was somewhere about 15*s*. per week. Last year the average payment made per week to blind men was £2 3*s*. 2*d*., and to blind women £1 15*s*. 4*d*. Among other undertakings for which the Institute is directly responsible are the Chorley Wood College for Blind Girls, three Sunshine Homes for Blind Babies, homes and hostels for blind women, and the management of the Greater London Fund, which assists all the leading metropolitan workshops and societies for the blind.